DICOM Conformance Statement

syngo CT VB20A

Product Name

SOMATOM X.ceed

SOMATOM X.cite

The DICOM Conformance Statement is also valid for regional product variants and configurations.

1 Overview

syngo CT supports storing DICOM images to remote nodes like workstations or Archiving Systems. Using the Storage Commitment Service it can request safe keeping of previously stored instances from an Archiving System. Additionally syngo CT can query remote notes, retrieve, and store selected instances from that node. Using the Modality Worklist (MWL) service syngo CT can query a HIS/RIS for scheduled procedures. Performed procedure status and other procedure data can be returned to the HIS/RIS using the Modality Performed Procedure Step (MPPS) Service. Furthermore printing of color and grayscale images is supported.

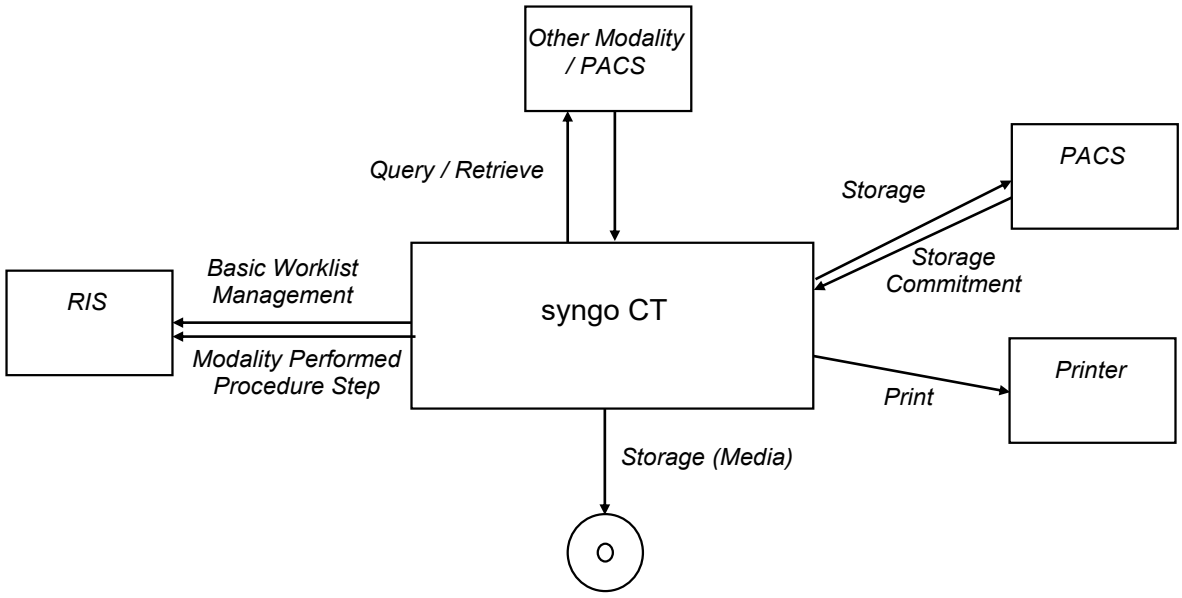

Figure 1.1-1 Overview of Implemented Services

1.1 Content and Transfer

Table 1.1-1 lists all Storage SOP Classes and the supported transfer mechanisms as well as the usage scenarios for those Instances.

The “Transfer Syntax Set” column lists the sets of Transfer Syntaxes defined in Table 1.1-2 that are applicable to each SOP Class. The “DIMSE”, “DICOM Web” and “Media Services” columns indicate the roles supported for each SOP Class.

The “Function” columns indicate how the Instances are used by the system:

- Create: The system creates Instances of the SOP Class. The type of the created SOP Class is indicated by one of the following abbreviations:
  - S: Standard SOP Class
  - SE: Standard Extended SOP Class

    - SP: Specialized SOP Class
    - P: Private SOP Class
- Display: The system displays the Instances of the SOP Class to the user, either by displaying the SOP Instances natively or by applying Instances of another suitable SOP Class to the image Instances (e.g., a Presentation State or CAD SR).
- Process: The system processes the Instances of the SOP Class to derive some further information that is made available to the user (e.g., a CAD processing algorithm, or a 3D Rendering).
- Archive: The system stores the Instances of the SOP Class and makes them available again.

Table 1.1-1 Storage SOP Classes

SOP Classes		Transfer Syntax Set	DIMSE Services		DICOM Web Services		Media Services			Function			
			SCU	SCP	UA	OS	FSC	FSU	FSR	Create	Display	Process	Archive
Media Storage Directory Storage	1.2.840.10008.1.3.10	U					Y	Y	Y	S	N	N	Y
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	C;U	Y	Y			Y	Y	Y	-	Y	N	Y
Digital X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.1	C;U	Y	Y			Y	Y	Y	-	Y	N	Y
Digital X-Ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	C;U	Y	Y			Y	Y	Y	-	Y	N	Y
Digital Mammography X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.2	C;U	Y	Y			Y	Y	Y	-	Y	N	Y
Digital Mammography X-Ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	C;U	Y	Y			Y	Y	Y	-	Y	N	Y
Digital Intra-Oral X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.3	C;U	Y	Y			Y	Y	Y	-	Y	N	Y
Digital Intra-Oral X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.3.1	C;U	Y	Y			Y	Y	Y	-	Y	N	Y
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	C;U	Y	Y			Y	Y	Y	SE	Y	Y	Y
Enhanced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.1	C;U	Y	Y			Y	Y	Y	-	Y	Y	Y
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	C;U	Y	Y			Y	Y	Y	-	Y	N	Y
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	C;U	Y	Y			Y	Y	Y	-	Y	N	Y
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1	C;U	Y	Y			Y	Y	Y	-	Y	N	Y
MR Spectroscopy Storage	1.2.840.10008.5.1.4.1.1.4.2	C;U	Y	Y			Y	Y	Y	-	Y	N	Y

SOP Classes		Transfer Syntax Set	DIMSE Services		DICOM Web Services		Media Services			Function			
			SCU	SCP	UA	OS	FSC	FSU	FSR	Create	Display	Process	Archive
Enhanced MR Color Image Storage	1.2.840.10008.5.1.4.1.1.4.3	C;U	Y	Y			Y	Y	Y	-	Y	N	Y
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	C;U	Y	Y			Y	Y	Y	-	Y	N	Y
Enhanced US Volume Storage	1.2.840.10008.5.1.4.1.1.6.2	C;U	Y	Y			Y	Y	Y	-	Y	N	Y
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	C;U	Y	Y			Y	Y	Y	SE	Y	Y	Y
Multi-frame Single Bit Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.1	C;U	Y	Y			Y	Y	Y	-	Y	N	Y
Multi-frame Grayscale Byte Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.2	C;U	Y	Y			Y	Y	Y	-	Y	N	Y
Multi-frame Grayscale Word Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.3	C;U	Y	Y			Y	Y	Y	-	Y	N	Y
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4	C;U	Y	Y			Y	Y	Y	-	Y	N	Y
12-lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1	U	Y	Y			Y	Y	Y	-	N	N	Y
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	U	Y	Y			Y	Y	Y	-	N	N	Y
Ambulatory ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.3	U	Y	Y			Y	Y	Y	-	N	N	Y
Hemodynamic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1	U	Y	Y			Y	Y	Y	-	N	N	Y

SOP Classes		Transfer Syntax Set	DIMSE Services		DICOM Web Services		Media Services			Function			
			SCU	SCP	UA	OS	FSC	FSU	FSR	Create	Display	Process	Archive
Cardiac Electrophysiology Waveform Storage	1.2.840.10008.5.1.4.1.1.9.3.1	U	Y	Y			Y	Y	Y	-	N	N	Y
Basic Voice Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.1	U	Y	Y			Y	Y	Y	-	N	N	Y
General Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.2	U	Y	Y			Y	Y	Y	-	N	N	Y
Arterial Pulse Waveform Storage	1.2.840.10008.5.1.4.1.1.9.5.1	U	Y	Y			Y	Y	Y	-	N	N	Y
Respiratory Waveform Storage	1.2.840.10008.5.1.4.1.1.9.6.1	U	Y	Y			Y	Y	Y	-	N	N	Y
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	U	Y	Y			Y	Y	Y	-	Y	Y	Y
Color Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.2	U	Y	Y			Y	Y	Y	-	Y	Y	Y
Pseudo-Color Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.3	U	Y	Y			Y	Y	Y	-	Y	N	Y
Blending Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.4	U	Y	Y			Y	Y	Y	-	Y	N	Y
Grayscale Planar MPR Volumetric Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.6	U	Y	Y			Y	Y	Y	-	Y	N	Y
Compositing Planar MPR Volumetric Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.7	U	Y	Y			Y	Y	Y	-	Y	N	Y
Advanced Blending Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.8	U	Y	Y			Y	Y	Y	-	Y	N	Y

SOP Classes		Transfer Syntax Set	DIMSE Services		DICOM Web Services		Media Services			Function			
			SCU	SCP	UA	OS	FSC	FSU	FSR	Create	Display	Process	Archive
Volume Rendering Volumetric Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.9	U	Y	Y			Y	Y	Y	-	Y	Y	Y
Segmented Volume Rendering Volumetric Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.10	U	Y	Y			Y	Y	Y	-	Y	Y	Y
Multiple Volume Rendering Volumetric Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.11	U	Y	Y			Y	Y	Y	-	Y	Y	Y
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	C;U	Y	Y			Y	Y	Y	-	Y	N	Y
Enhanced XA Image Storage	1.2.840.10008.5.1.4.1.1.12.1.1	C;U	Y	Y			Y	Y	Y	-	Y	N	Y
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	C;U	Y	Y			Y	Y	Y	-	Y	N	Y
Enhanced XRF Image Storage	1.2.840.10008.5.1.4.1.1.12.2.1	C;U	Y	Y			Y	Y	Y	-	Y	N	Y
X-Ray 3D Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.13.1.1	C;U	Y	Y			Y	Y	Y	-	Y	N	Y
Breast Tomosynthesis Image Storage	1.2.840.10008.5.1.4.1.1.13.1.3	C;U	Y	Y			Y	Y	Y	-	Y	N	Y
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	C;U	Y	Y			Y	Y	Y	-	Y	N	Y
Raw Data Storage	1.2.840.10008.5.1.4.1.1.66	U	Y	Y			Y	Y	Y	SE	N	N	Y
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1	U	Y	Y			Y	Y	Y	S	Y	Y	Y
Spatial Fiducials Storage	1.2.840.10008.5.1.4.1.1.66.2	U	Y	Y			Y	Y	Y	-	Y	N	Y

SOP Classes		Transfer Syntax Set	DIMSE Services		DICOM Web Services		Media Services			Function			
			SCU	SCP	UA	OS	FSC	FSU	FSR	Create	Display	Process	Archive
Deformable Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.3	U	Y	Y			Y	Y	Y	-	Y	N	Y
Segmentation Storage	1.2.840.10008.5.1.4.1.1.66.4	U	Y	Y			Y	Y	Y	-	Y	N	Y
Surface Segmentation Storage	1.2.840.10008.5.1.4.1.1.66.5	U	Y	Y			Y	Y	Y	SE	Y	Y	Y
Real World Value Mapping Storage	1.2.840.10008.5.1.4.1.1.67	U	Y	Y			Y	Y	Y	-	Y	N	Y
Basic Text SR Storage	1.2.840.10008.5.1.4.1.1.88.11	U	Y	Y			Y	Y	Y	-	Y	N	Y
Enhanced SR Storage	1.2.840.10008.5.1.4.1.1.88.22	U	Y	Y			Y	Y	Y	See Table 1.1-3			
Comprehensive SR Storage	1.2.840.10008.5.1.4.1.1.88.33	U	Y	Y			Y	Y	Y	See Table 1.1-3			
Procedure Log Storage	1.2.840.10008.5.1.4.1.1.88.40	U	Y	Y			Y	Y	Y	-	Y	N	Y
Mammography CAD SR Storage	1.2.840.10008.5.1.4.1.1.88.50	U	Y	Y			Y	Y	Y	-	Y	N	Y
X-Ray Radiation Dose SR Storage	1.2.840.10008.5.1.4.1.1.88.67	U	Y	Y			Y	Y	Y	See Table 1.1-3			
Radiopharmaceutical Radiation Dose SR Storage	1.2.840.10008.5.1.4.1.1.88.68	U	Y	Y			Y	Y	Y	-	Y	N	Y
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1	U	Y	Y			Y	Y	Y	-	Y	N	Y
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	C;U	Y	Y			Y	Y	Y	-	Y	N	Y
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	C;U	Y	Y			Y	Y	Y	-	Y	N	Y
RT Dose Storage	1.2.840.10008.5.1.4.1.1.481.2	U	Y	Y			Y	Y	Y	-	Y	N	Y
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3	U	Y	Y			Y	Y	Y	-	Y	N	Y
RT Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.4	U	Y	Y			Y	Y	Y	-	N	N	Y

SOP Classes		Transfer Syntax Set	DIMSE Services		DICOM Web Services		Media Services			Function			
			SCU	SCP	UA	OS	FSC	FSU	FSR	Create	Display	Process	Archive
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5	U	Y	Y			Y	Y	Y	-	Y	N	Y
RT Brachy Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.6	U	Y	Y			Y	Y	Y	-	N	N	Y
RT Treatment Summary Record Storage	1.2.840.10008.5.1.4.1.1.481.7	U	Y	Y			Y	Y	Y	-	N	N	Y
RT Ion Plan Storage	1.2.840.10008.5.1.4.1.1.481.8	U	Y	Y			Y	Y	Y	-	N	N	Y
RT Ion Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.9	U	Y	Y			Y	Y	Y	-	N	N	Y
Hanging Protocol Storage	1.2.840.10008.5.1.4.38.1	U	Y	Y			Y	Y	Y	-	Y	N	Y
Syngo Non-Image Storage	1.3.12.2.1107.5.9.1	U	Y	Y			Y	Y	Y	-	N	N	Y

Table 1.1-2 Supported Transfer Syntaxes

Transfer Syntax Set	Transfer Syntax Name	Transfer Syntax UID	DICOM Web Service Bulkdata Media Type
Compressed Transfer Syntax Set (C)	JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50	
	JPEG Extended (Process 2 & 4)	1.2.840.10008.1.2.4.51	
	JPEG Lossless, Non-Hierarchical (Process 14)	1.2.840.10008.1.2.4.57	
	JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14 [Selection Value 1])	1.2.840.10008.1.2.4.70	
	JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90	
	JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91	
	RLE Lossless	1.2.840.10008.1.2.5	
Uncompressed Transfer Syntax Set (U)	Implicit VR Little Endian	1.2.840.10008.1.2	
	Explicit VR Little Endian	1.2.840.10008.1.2.1	
	Explicit VR Big Endian (Retired)	1.2.840.10008.1.2.2	

1.1.1 Structured Reporting Root Template IDs

Table 1.1-3 lists all Template IDs (TID) of Root Templates that are supported by the system. The "Function" column indicates how the system uses the content of the DICOM SR:

- CREATE: The system creates Instances using the specified TID.
- RENDER: The system displays the content of the SR, without using the data for any processing.
- EXTRACT_DATA: The system can extract structured data from the content and use the data for subsequent processing (e.g. reporting).
- OVERLAY: The system uses the information in the SR to display information directly on the images (e.g. Mammography CAD markers).
- ARCHIVE: The system stores Instances for later retrieval.

The "SOP Class UID" column indicates which of the SR Storage SOP Classes are used to encode the information or to store it. If multiple SOP Classes are supported, the "Condition" column describes the conditions for using the different SOP Classes.

Table 1.1-3 Supported SR Root Template IDs (TID)

Name	Root TID	Function	SOP Classes		Condition
CT Radiation Dose (TID 10011)	10011	CREATE; ARCHIVE; RENDER	X-Ray Radiation Dose SR Storage	1.2.840.10008.5.1.4.1.1.88.67	

Name	Root TID	Function	SOP Classes		Condition
Measurement Report (TID 1500)	1500	CREATE; ARCHIVE; RENDER	Comprehensive SR Storage	1.2.840.10008.5.1.4.1.1.88.33	
CT Examination SR	EXAMREPORT	CREATE; ARCHIVE; RENDER	Enhanced SR Storage	1.2.840.10008.5.1.4.1.1.88.22	

1.2 DIMSE Services

1.2.1 Verification

Table 1.2-1 lists support for the Verification SOP Class.

Table 1.2-1 Verification SOP Class

SOP Classes		Transfer Syntax		SCU	SCP
Verification SOP Class	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2		

1.2.2 Storage

For details on supported Storage SOP Classes see Section 1.1.

1.2.3 Workflow Management

Table 1.2-2 lists all supported Workflow Management SOP Classes.

Table 1.2-2 Workflow Management SOP Classes

SOP Classes		Transfer Syntaxes		SCU	SCP
Modality Worklist Information Model – FIND	1.2.840.10008.5.1.4.31	Implicit VR Little Endian	1.2.840.10008.1.2	Y	N
		Explicit VR Little Endian	1.2.840.10008.1.2.1	Y	N
		Explicit VR Big Endian (Retired)	1.2.840.10008.1.2.2	Y	N
Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3	Implicit VR Little Endian	1.2.840.10008.1.2	Y	N
		Explicit VR Little Endian	1.2.840.10008.1.2.1	Y	N
		Explicit VR Big Endian (Retired)	1.2.840.10008.1.2.2	Y	N
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1	Implicit VR Little Endian	1.2.840.10008.1.2	Y	N
		Explicit VR Little Endian	1.2.840.10008.1.2.1	Y	N
		Explicit VR Big Endian (Retired)	1.2.840.10008.1.2.2	Y	N

1.2.4 Query/Retrieve

Table 1.2-3 lists all supported Query/Retrieve SOP Classes.

Table 1.2-3 Query/Retrieve SOP Classes

SOP Classes		Transfer Syntaxes		DIMSE	
				SCU	SCP
Study Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	Implicit VR Little Endian	1.2.840.10008.1.2	Y	Y
		Explicit VR Little Endian	1.2.840.10008.1.2.1	Y	Y
		Explicit VR Big Endian (Retired)	1.2.840.10008.1.2.2	Y	Y
Study Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	Implicit VR Little Endian	1.2.840.10008.1.2	Y	Y
		Explicit VR Little Endian	1.2.840.10008.1.2.1	Y	Y
		Explicit VR Big Endian (Retired)	1.2.840.10008.1.2.2	Y	Y
Patient Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	N	Y
		Explicit VR Little Endian	1.2.840.10008.1.2.1	N	Y
		Explicit VR Big Endian (Retired)	1.2.840.10008.1.2.2	N	Y
Patient Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.1.2	Implicit VR Little Endian	1.2.840.10008.1.2	N	Y
		Explicit VR Little Endian	1.2.840.10008.1.2.1	N	Y
		Explicit VR Big Endian (Retired)	1.2.840.10008.1.2.2	N	Y
Patient/Study Only Query/Retrieve Information Model – FIND (Retired)	1.2.840.10008.5.1.4.1.2.3.1	Implicit VR Little Endian	1.2.840.10008.1.2	N	Y
		Explicit VR Little Endian	1.2.840.10008.1.2.1	N	Y
		Explicit VR Big Endian (Retired)	1.2.840.10008.1.2.2	N	Y
Patient/Study Only Query/Retrieve Information Model – MOVE (Retired)	1.2.840.10008.5.1.4.1.2.3.2	Implicit VR Little Endian	1.2.840.10008.1.2	N	Y
		Explicit VR Little Endian	1.2.840.10008.1.2.1	N	Y
		Explicit VR Big Endian (Retired)	1.2.840.10008.1.2.2	N	Y

1.2.5 Printing

Table 1.2-4 lists all supported Printing SOP Classes.

Table 1.2-4 Printing SOP Classes

SOP Classes	SOP Class UID	Transfer Syntaxes		SCU	SCP
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	Implicit VR Little Endian	1.2.840.10008.1.2	Y	N
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18	Implicit VR Little Endian	1.2.840.10008.1.2	Y	N
Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	Y	N
Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	Implicit VR Little Endian	1.2.840.10008.1.2	Y	N
Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4	Implicit VR Little Endian	1.2.840.10008.1.2	Y	N

Basic Color Image Box SOP Class	1.2.840.10008.5.1.1.4.1	Implicit VR Little Endian	1.2.840.10008.1.2	Y	N
Printer SOP Class	1.2.840.10008.5.1.1.16	Implicit VR Little Endian	1.2.840.10008.1.2	Y	N
Print Job SOP Class	1.2.840.10008.5.1.1.14	Implicit VR Little Endian	1.2.840.10008.1.2	Y	N
Presentation LUT SOP Class	1.2.840.10008.5.1.1.23	Implicit VR Little Endian	1.2.840.10008.1.2	Y	N

1.3 DICOM Web Services

N/A

1.4 Media Services

Table 1.4-1 lists all supported Media Storage Application Profiles.

Table 1.4-1 Supported Media Storage Application Profiles

Media Storage Application Profile	FSC	FSR	FSU
Compact Disk – Recordable			
AUG-GEN-CD	Y	Y	N
DVD			
AUG-GEN-DVD-RAM	Y	Y	N
Blu-ray			
AUG-GEN-BD	Y	Y	N
USB			
AUG-GEN-USB	Y	Y	Y

1.5 Real Time Video Service

N/A

1.6 De-Identification Profiles

De-Identification as described in DICOM PS3.15 is not supported. To protect PHI/PII a Data Minimization mechanism as described in Section 8.8 is implemented.

1.7 Specific Character Sets

Table 1.7-1 lists all supported Specific Character Sets.

Table 1.7-1 Supported Specific Character Sets

Defined Term	IANA	Description
Single-Byte Character Sets without Code Extensions		
None / ISO_IR 6[1)]	ISO-646	Default Repertoire
ISO_IR 100	ISO-8859-1	Latin Alphabet No. 1 (West European)
ISO_IR 101	ISO-8859-2	Latin Alphabet No. 2 (Central European)

Defined Term	IANA	Description
ISO_IR 109	ISO-8859-3	Latin Alphabet No. 3 (South European)
ISO_IR 110	ISO-8859-4	Latin Alphabet No. 4 (North European)
ISO_IR 144	ISO-8859-5	Cyrillic
ISO_IR 127	ISO-8859-6	Arabic
ISO_IR 126	ISO-8859-7	Greek
ISO_IR 138	ISO-8859-8	Hebrew
ISO_IR 148	ISO-8859-9	Turkish
ISO_IR 13	JIS_X0201	Japanese (half-width Katakana)
ISO_IR 166	ISO-8859-11	Thai
Single-Byte Character Sets with Code Extension		
ISO 2022 IR 6		Default repertoire
ISO 2022 IR 100		Latin Alphabet No. 1 (West European)
ISO 2022 IR 101		Latin Alphabet No. 2 (Central European)
ISO 2022 IR 109		Latin Alphabet No. 3 (South European)
ISO 2022 IR 110		Latin Alphabet No. 4 (North European)
Multi-Byte Character Sets without Code Extensions		
GB18030[2)]	GB18030	GB18030-2000 (P.R China Norm GB18030)
ISO_IR 192	UTF-8	Unicode in UTF-8
Multi-Byte Character Sets with Code Extensions		
ISO 2022 IR 87	ISO-2022-JP	Japanese (full-width Katakana, Hiragana and Kanji)
ISO 2022 IR 149	ISO-2022-KR	Korean (Hangul and Hanja)

1) If an imported DICOM Object does contain ISO_IR 6 in the Attribute (0008,0005), this value will be kept during the Export.

2) syngo CT supports GB18030:2022.

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3 Introduction

3.1 Revision History

Revision	Date	Product Version(s)	Change
1.0	2020-06-11	Somaris/10 VA40A	Usage of new DCS Template Fix Value, Presence of Value and Source issues in all module tables Add Referenced Study Sequence in Table 76 Add missing DICOM Attributes in Table 77 Add notes in Value in Table 84 Add new Filter types in Table 85 Add new Exposure Modulation Types in Table 85 Add (0018,9361) in Table 85 Add missing Image Type in Table 85 Add 9.1.2.11.2 (Supplement 188) Add 9.1.2.11.3 & 9.1.2.11.4 (Supplement 188) Add hint in 9.1.2.12 for Multi Frame images Add 9.1.2.15 Multi-Energy CT Image Module Add Table 98 Add Table 99 Add Table 100 Add 9.1.4.4.1 & 9.1.4.4.2 Image Type Values Add 9.1.4.6 Image Plane Module Add hint in 9.1.4.9 for Multi Frame images Add 9.1.7 Spatial Registration
1.1	2022-02-17	Somaris/10 VA40A SP2	Fix inadequate documentation of capabilities in Table 1 (no changes in implementation): • SOP Classes managed by Somaris/10: Move Raw Data Storage Class from created to managed section (Raw Data Storage SOP Class header only used internally), no Display supported • SOP Classes managed by Somaris/10: Set Created flag to False for all SOP classes in that section which was incorrectly set to True before • SOP Classes managed by Somaris/10: Set Display flag for all Waveform SOP Classes to False, which was incorrectly set to True before

Revision	Date	Product Version(s)	Change
			• SOP Classes managed by Somaris/10: Set Display flag for some RT SOP classes to False which were incorrectly set to True before • Query / Retrieve (adaptions also in chapter 4.2.4.3.1): Only Study Root Q/R – Information Model – FIND/MOVE are supported (SCU and SCP) Corrected UIDs of Q/R SOP Classes Added a note in chapter 9.1.3 that Raw Data Storage SOP class is only used internally by the SW (see above). Added description for RT Structure Set Storage SOP class in chapter 9.1.8**Error! Reference source not found.** Fix Table numbering
2.0	2022-05-10	Somaris/10 VA50A	Usage of Brandville DCS template. Fix inadequate documentation of capabilities in Table 1 (no changes in implementation): • SOP Classes managed by Somaris/10: Move Segmentation Class from created to managed section • SOP Classes managed by Somaris/10: Move Spatial Registration Storage Class from managed to created section Add CT_SOM8 DEMEP as Image Type Value 4 in 9.1.2.13.1 Explain Image Types for NAEOTOM Alpha in 9.1.2.11.2 Add Structured Reporting Templates ID (PS3.16) in 9.3.2 Add UI values in table 34 Add info about switch on/off option for Supplement 188 Add Japanese in table 70 Add profile dependent de-identification for raw data table Add General Acquisition and Reference module in 9.1.2 Add missing attributes in chapter 9

Revision	Date	Product Version(s)	Change
			Remove Scan Range Data module in 9.1.3 Fix missing Private Code Definitions in 9.3.3 Fix issues in figures Fix issues in chapter 9
3.0	2023-09-25	Somaris/10 VB10A	Changes in platform template: - Adding N-CREATE and N-SET message content Tables - Data Flow Diagram has been re-worked - Print diagram was removed - Renaming chapters in the Association Acceptance Policy of the Print AE - Sub-chapters added to the Association Acceptance Policy of the Query/Retrieve AE - Added capability for Storage Commitment SCP and Query/Retrieve SCP - Updating supported compression methods (YBR), chapter Proposed Presentation Contexts - Add chapter 4.2.3.3.2 Activity "Send Reply to Initial Storage Commitment Request" - Add attributes in sections of 4.2.6 Finished transition from SRT to SCT according to DICOM change proposal 1850 Extend list of scanners on cover page Add Image type CT_SOM 3DCAM and adapt image DICOM tags for RGB images in case of 3D camera images in 9.1.1.3.5.1 Add A.9 Surface Segmentation SOP Class Add 9.1.1.6.4 SR Document General Module Add 9.1.1.6 Comprehensive SR Add TID 10014 Add filter type IMAGE in 9.1.1.3.5.1 Restructure chapter 9 acc. to template Renaming chapter 7.1 and 7.2 (from De-Identification to Data Minimization
3.1	2024-02-29	Somaris/10 VB10A	- Table 1: Changed SCP to "No" for Storage Commitment Push Model SOP to conform to implementation. Chapters below 4.2.3. describing the SCP were adapted/removed. - Corrected documentation of supported Media Storage Application Profiles (Table 2, Chapter 5.2.1)

Revision	Date	Product Version(s)	Change
			- Improved documentation of the Verification SOP Class in 4.2.1 - Corrected documentation of Q/R SCP: Support for Matching Keys on Instance Level; Added missing Information Models. - Corrected some small inconsistencies, formatting & spelling issues - Extended the Configuration chapter 4.4 - adding missing configuration items - Correct (0018,0015) Body Bart Examined acc. to CP-2232 (only documentation issue)
4.0	2024-07-12	Somaris/10 VB20A	- Add Products NAEOTOM - Add missing image types - Remove (0018,9324) - Add TID 1500
	2024-08-21	Somaris/10 VB20A	- Add reference to syngo document for myAblation Guide Raw Data - Add DTID15019.3.2.3
	2025-02-27	Somaris/10 VB20A	- New DICOM Conformance Statement Template was applied. (Moved from Part 2 Annex A to Annex N) - Adding the following Attributes to Data Minimization profiles: o Retrieve AE Title (0008,0054) o Station AE Title (0008,0055) o Network ID (0008,1000) o Selector AE Value (0072,005E) o Receiving AE Title (0074,1234) o Requesting AE Title (0074,1236) o Originator (2100,0070) o Destination AE (2100,0140) - Added “Media Storage Directory Storage” in Table 1.1-1 - Add private tags
4.1 – P60	2025-05-13	Somaris/10 VB20A SP2	- Released only for X.cite and X.ceed (change legal manufacturer from GmbH to AG, remove all non P60 systems in tag (0008,1090)
4.2 – P60	2025-10-10	Somaris/10 VB20A SP2	- Marked “Raw Data Storage” as created IOD in Table 1.1-1

Revision	Date	Product Version(s)	Change
			- Marked "Encapsulated PDF Storage" and "RT Structure Set Storage " as not created IODs (was inserted in VB20 by fault) in Table 1.1-1 - Various smaller corrections

3.2 Audience

This document is intended for the audience listed below. It is assumed that the reader has a working knowledge of the DICOM Standard.

The document structure was designed for easier access to relevant information for different user groups:

- **Clinical Users**, who want to get an overview of the implemented interoperability features of the system can see Section 4 Implementation Model.
- Personnel involved in **Sales** can use the information in Section 1to assess the compatibility between different systems involved in a sales situation.
- **System Integrators** can use information in Section 6 during system installation and also information from Section 5 Service and Interoperability Description for details regarding the implemented services.
- **Field Service Engineers** can use the details from Section 5 Service and Interoperability Description and from Section 7 Network and Media Communication Details for troubleshooting.
- **Hospital IT staff** focusing on security can use the details provided in Section 8 Security regarding implemented Security features.
- **Research Personnel** may be interested in using information provided in Annex A Information Object Definitions (IODs) or Annex B Structured Report Content Encoding to get detailed imaging and measurement information.

3.3 Remarks

The scope of this DICOM Conformance Statement is to facilitate integration between syngo CT and other DICOM products. The Conformance Statement should be read and understood in conjunction with the DICOM Standard [1]. DICOM by itself does not guarantee interoperability.

- The Conformance Statement does, however, facilitate a first-level comparison for interoperability between different applications supporting compatible DICOM functionality.
- This Conformance Statement should not replace validation with other DICOM equipment to ensure proper exchange of intended information. In fact, it is the user's responsibility to perform the following validation activities:
    - The comparison of Conformance Statements from syngo CT and other DICOM conformant equipment is the first step towards assessing interconnectivity and interoperability between those systems.
    - Test procedures should be defined and executed to validate the required level of interoperability with specific DICOM conformant equipment, as established by the healthcare facility.

The Product has participated in an industry-wide testing program sponsored by Integrating the Healthcare Enterprise (IHE). The IHE Integration Statement of the Product together with the IHE Technical Framework may facilitate the process of validation testing.

3.4 Terms and Definitions

The following list includes DICOM Terms, that are used throughout this Conformance Statement:

Abstract Syntax	The information agreed to be exchanged between applications, generally equivalent to a Service/Object Pair (SOP) Class. Examples: Verification SOP Class, Modality Worklist Information Model Find SOP Class, Computed Radiography Image Storage SOP Class.
Application Entity (AE)	A representation of the external behavior of an application process in terms of DICOM Network Services, Web Services and/or media exchange capabilities implemented in one or more roles. A single device may have multiple Application Entities.
Application Entity Title (AET)	The externally known name of an Application Entity, used to identify a DICOM application to other DICOM applications on the network.
Application Context	The specification of the type of communication used between Application Entities. Example: DICOM network protocol.
Association	A network communication channel set up between Application Entities.
Attribute	A unit of information in an object definition; a Data Element identified by a tag. The information may be a complex Data Structure (Sequence), itself composed of lower-level Data Elements. Examples: Patient ID (0010,0020), Accession Number (0008,0050), Photometric Interpretation (0028,0004), Procedure Code Sequence (0008,1032).
Information Object Definition (IOD)	The specified set of Attributes that comprise a type of data object; does not represent a specific Instance of the data object, but rather a class of similar data objects that have the same properties. Examples: MR Image IOD, CT Image IOD, Print Job IOD. The Attributes within an IOD may be specified as Mandatory (Type 1), Required but possibly unknown (Type 2), or Optional (Type 3), and there may be conditions associated with the use of an Attribute (Types 1C and 2C).
Media Storage Application Profile	The specification of DICOM information objects and encoding exchanged on removable media (e.g., CDs).
Module	A set of Attributes within an Information Object Definition that are logically related to each other. Example: Patient Module includes Patient's Name, Patient ID, Patient' Birth Date, and Patient's Sex.
Negotiation	First phase of Association establishment that allows Application Entities to agree on the types of data to be exchanged and how that data will be encoded.
Origin Server	Refers to the program that can originate authoritative responses to HTTP requests for a given Target Resource. The term "server" refers to any implementation that receives a web service request message from a user agent.
Presentation Context	The set of DICOM Network Services used over an Association, as negotiated between Application Entities; includes Abstract Syntaxes and Transfer Syntaxes.
Private SOP Class	A SOP Class that is not defined in the DICOM Standard but is published in an implementation's Conformance Statement.
Protocol Data Unit (PDU)	A packet (piece) of a DICOM message sent across the network. Devices must specify the maximum size packet they can receive for DICOM messages.
Security Profile	A set of mechanisms, such as encryption, user authentication, or digital signatures, used by an Application Entity to ensure confidentiality, integrity, and/or availability of exchanged DICOM Data.
Service Class Provider (SCP)	Role of an Application Entity that provides a DICOM network service; typically, a server that performs operations requested by another Application Entity (Service Class User).

	Examples: Picture Archiving and Communication System (image storage SCP, and image query/retrieve SCP), Radiology Information System (modality worklist SCP).
Service Class User (SCU)	Role of an Application Entity that uses a DICOM Network Service; typically, a client. Examples: imaging modality (image storage SCU, and modality worklist SCU), imaging workstation (image query/retrieve SCU).
Service/Object Pair Class (SOP Class)	The specification of the network or media transfer (service) of a particular type of data (object); the fundamental unit of DICOM interoperability specification. Examples: Ultrasound Image Storage Service, Basic Grayscale Print Management.
Service/Object Pair Instance (SOP Instance)	An information object: a specific occurrence of information exchanged in a SOP Class. E.g., a specific X-ray image.
Specialized SOP Class	A SOP Class that is derived from the Standard that is specialized by additional type 1, 1C, 2, 2C, or 3 Attributes by enumeration of specific permitted values for Attributes, or by enumeration of specific permitted Templates. The additional Attributes may either be drawn from the Data Dictionary in PS3.6 or may be Private Attributes.
Standard SOP Class	A SOP Class defined in the Standard, and that is implemented and used without any modifications.
Standard Extended SOP Class	A SOP Class that is defined in the standard, and that is extended by additional type 3 Attributes. The additional Attributes may either be drawn from the DICOM Data Dictionary in PS3.6 or may be Private Attributes.
Tag	A 32-bit identifier for a Data Element, represented as a pair of four-digit hexadecimal numbers, the "group" and the "element". If the "group" number is odd, the tag is for a private (manufacturer-specific) Data Element. Examples: (0010,0020) [Patient ID], (07FE,0010) [Pixel Data], (0019,0210) [private Data Element].
Transfer Syntax	The encoding used for exchange of DICOM information objects and messages. Examples: JPEG compressed (images), Little Endian Explicit Value Representation.
TLS-Secured Port	TCP port on which an implementation accepts TLS connections to exchange DICOM information.
Unique Identifier (UID)	A globally unique "dotted decimal" string that identifies a specific object or a class of objects; an ISO-8824 Object Identifier. Examples: Study Instance UID, SOP Class UID, SOP Instance UID.
User Agent	A client in a network protocol used in communications within a client–server distributed computing system. In particular, the Hypertext Transfer Protocol (HTTP) identifies the client software originating the request, using a user-agent header, even when the client is not operated by a user.
Value Representation (VR)	The format type of an individual DICOM Data element, such as text, an integer, a person's name, or a code. DICOM information objects can be transmitted with either explicit identification of the type of each Data Element (Explicit VR), or without explicit identification (Implicit VR); with Implicit VR, the receiving application must use a DICOM Data dictionary to look up the format of each Data Element.
Logging	Activity records, which are public and do not contain PHI and PII, just technical data to help to find out afterwards, what exactly happened or to the root cause of eventual issues. The logging cannot be switched off.
Tracing	A detailed, code level activity record, which can only be used for debugging purposes. Tracing is switched off by default. Switching the tracing on will affect the performance and a warning is going to be displayed on the GUI with the text “Not for clinical use”.

3.5 Abbreviations

Abbreviations that are used in this DICOM Conformance Statement are listed here.

AE	Application Entity
AET	Application Entity Title
CAD	Computer Aided Detection
CDA	Clinical Document Architecture
CID	Context Identifier
CT	Computed Tomography
DCS	DICOM Conformance Statement
DHCP	Dynamic Host Configuration Protocol
DICOM	Digital Imaging and Communications in Medicine
DIS	Departmental Information System
ELE	Explicit VR Little Endian
FoR	Frame of Reference
FSC	File-Set Creator
FSU	File-Set Updater
FSR	File-Set Reader
HIS	Hospital Information System
IANA	Internet Assigned Numbers Authority
IHE	Integrating the Healthcare Enterprise
ILE	Implicit VR Little Endian
IOD	Information Object Definition
IPv4	Internet Protocol version 4
IPv6	Internet Protocol version 6
ISO	International Organization for Standardization
MPPS	Modality Performed Procedure Step
MWL	Modality Worklist
NEMA	National Electrical Manufacturers Association
NTP	Network Time Protocol
OID	Object Identifier
OS	Origin Server
PDU	Protocol Data Unit
PHI	Protected Health Information
PII	Personal Identifiable Information
PPS	Performed Procedure Step
RIS	Radiology Information System

SCP	Service Class Provider
SCU	Service Class User
SOP	Service-Object Pair
SPS	Scheduled Procedure Step
SR	Structured Reporting
TCP/IP	Transmission Control Protocol/Internet Protocol
TID	Template Identifier
TLS	Transport Layer Security
UA	User Agent
UI	User Interface
UID	Unique Identifier
UL	Upper Layer
VR	Value Representation

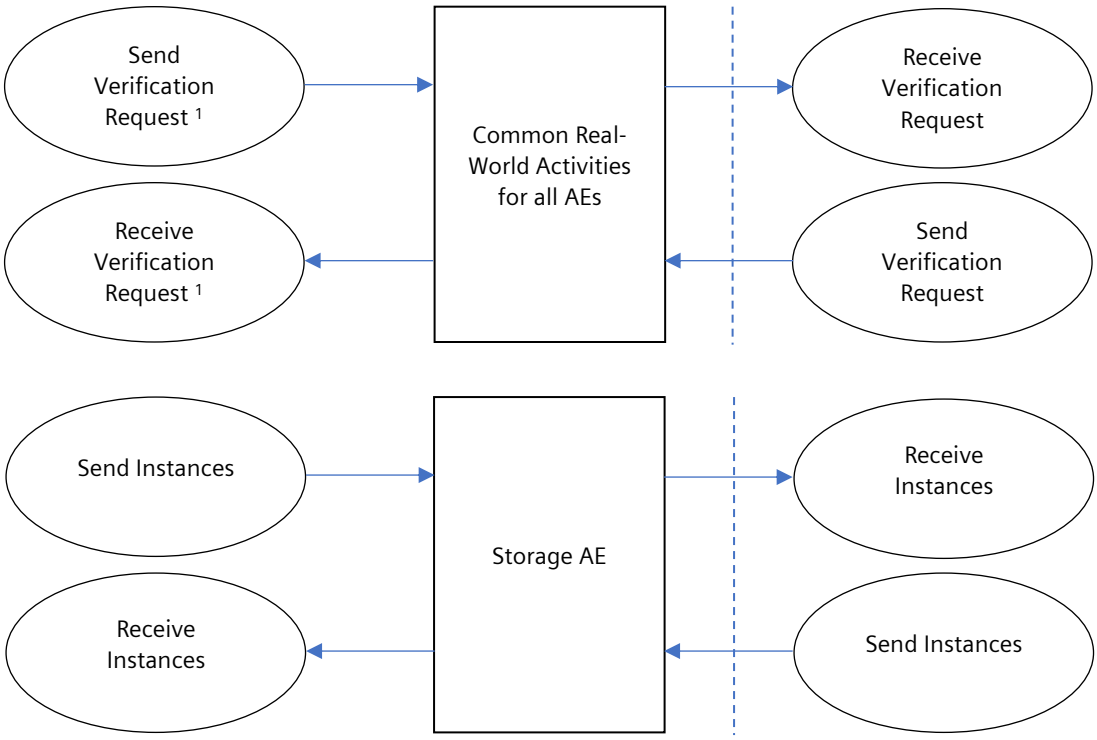
3.6 References

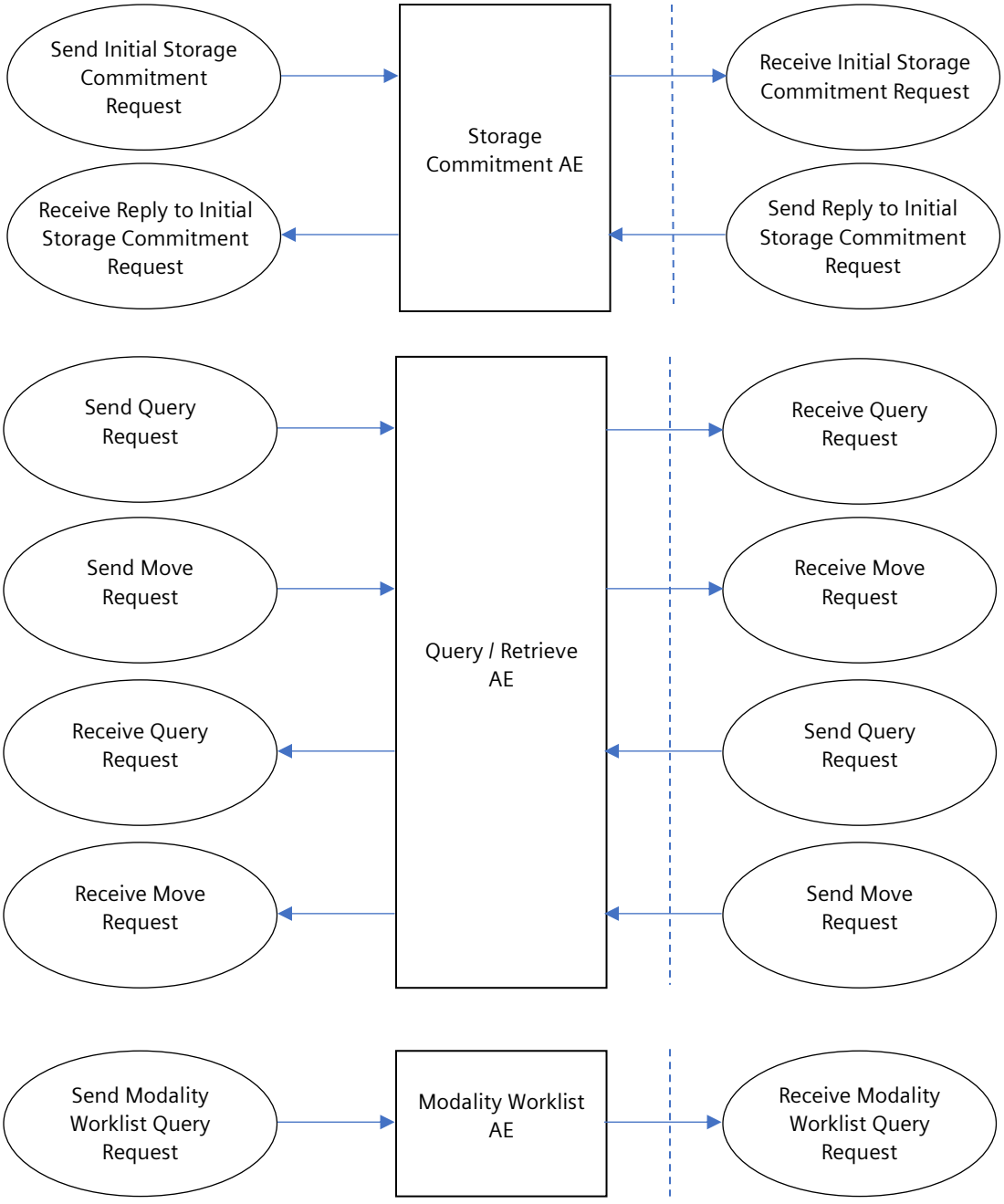
1. NEMA PS3 / ISO 12052, Digital Imaging and Communications in Medicine (DICOM) Standard, National Electrical Manufacturers Association, Rosslyn, VA, USA (available free at http://www.dicomstandard.org/current)
2. IHE Radiology Technical Framework (available free at https://www.ihe.net/Resources/technical_frameworks/#radiology)

4 Implementation Model

4.1 Application Entities and Data Flow

The network and media interchange application model for syngo CT is shown in Figure 4.1-1: syngo CT Application Data Flow Diagram.




Send Initial Storage Commitment Request
Storage Commitment AE
Receive Initial Storage Commitment Request
Receive Reply to Initial Storage Commitment Request
Send Reply to Initial Storage Commitment Request
Send Query Request
Send Move Request
Receive Query Request
Receive Move Request
Query / Retrieve AE
Receive Query Request
Receive Move Request
Send Query Request
Send Move Request
Send Modality Worklist Query Request
Modality Worklist AE
Receive Modality Worklist Query Request

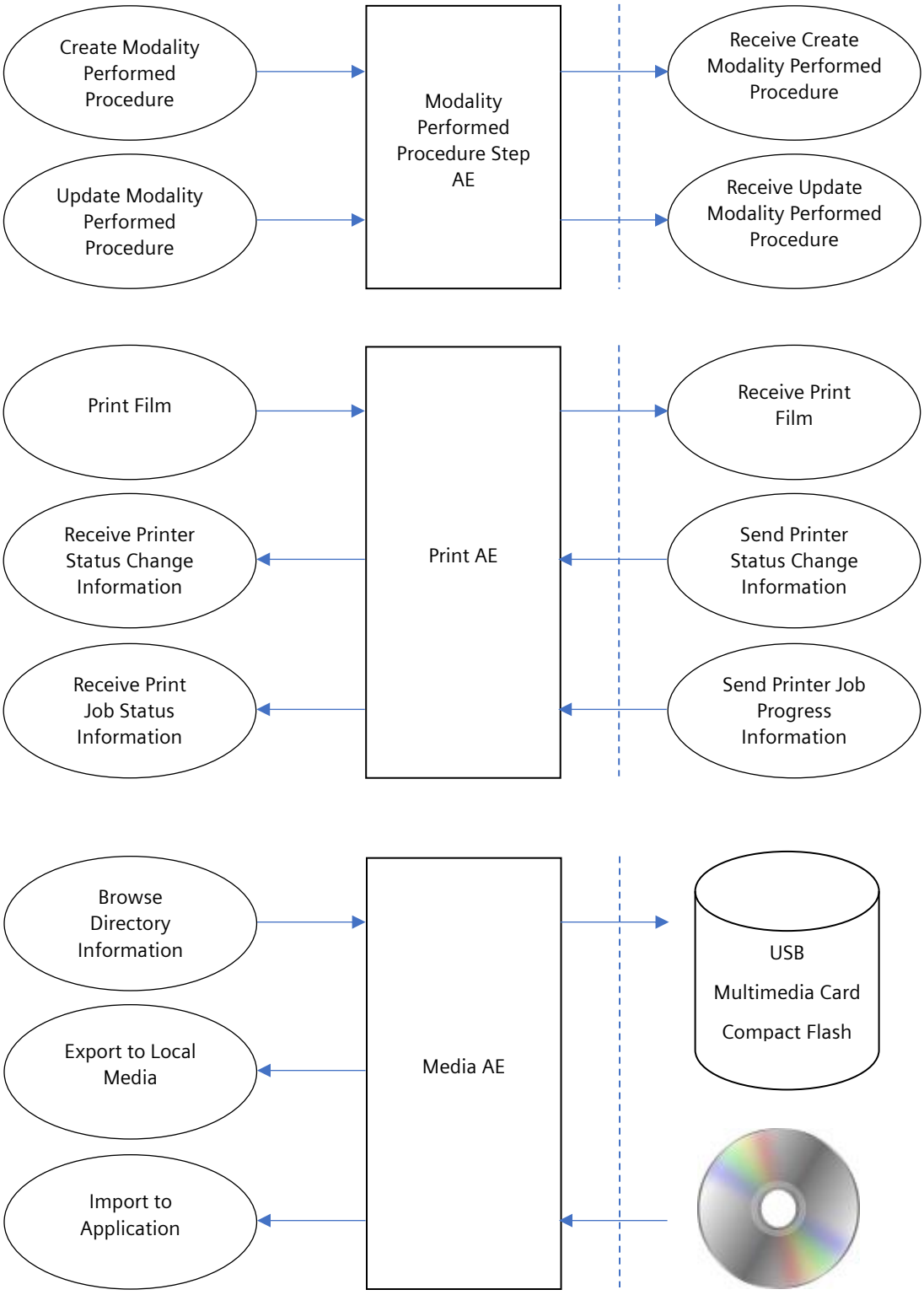


Figure 4.1-1: syngo CT Application Data Flow Diagram

[1] The “Send Verification Request” and “Receive Verification Request” Activities are supported by each AE using DIMSE services. For ease of documentation these activities are described once at the beginning of the diagram.

syngo CT allows flexible configuration of services into Application Entities. The diagram above describes the most detailed configuration possible. This can vary at customer sites depending on the local setup.

The SCU components of the Application Entity are invoked upon requests from the user interface or indirect by trigger from internal processes.

The SCP components of the Application Entities of syngo CT described in the following subsections operate as background server processes. They exist as soon as the system is powered up and wait for Association requests. Upon accepting an Association with a negotiated Presentation Context they start to receive and process the requests described in the following sections.

4.1.1 Functionality Common to all AEs

syngo CT supports the Verification Service as an SCP and SCU. As an SCU, Verification can be activated from the Administrator Portal during system configuration by sending a C-ECHO-RQ for each configured AE.

As an SCP of the Verification Service each AE of syngo CT processes and responds to incoming Verification Requests using the C-ECHO-RSP.

4.1.2 Functional Definition of Storage AE

The SCU of the Storage AE of syngo CT is invoked directly by the user, by an auto-archive trigger or internally by the Query/Retrieve Application Entity that is responsible for processing retrieve requests. The job consists of data describing the Composite Objects selected for Storage and the destination Application Entity Title. An Association is negotiated with the destination Application Entity and the imaging data is transferred using the C-STORE-RQ. The transfer status is reported to the initiator of the Storage request.

The SCP of the Storage AE of syngo CT starts to receive the Composite Objects and imports them into the database after accepting an Association with a negotiated Presentation Context. The system responds to the Storage Request immediately after reception of the data.

4.1.3 Functional Definition of Storage Commitment AE

If configured, syngo CT can serve as an SCU for the DICOM Storage Commitment Service. Upon successful completion of a Storage SCU job, the system uses the N-ACTION-RQ to request Storage Commitment from a remote DICOM Storage Commitment SCP. This can either be the same as the Storage destination or a different system depending on the system configuration. Storage Commitment Requests are sent after a configurable delay after storing the objects. syngo CT can receive the N-EVENT-REPORT-RQ on the same or a different Association. In this case a reverse SCP/SCU Role Selection Negotiation takes place.

4.1.4 Functional Definition of Query/Retrieve AE

syngo CT supports DICOM Query/Retrieve as an SCU: The user can initiate a query to a remote node using the C-FIND-RQ. After matching the specified keys, the remote Query/Retrieve SCP uses the C-FIND-RSP to return the results of its search, which will be displayed to the user. Depending on user action syngo CT Query/Retrieve AE SCU sends a C-MOVE-RQ to initiate a C-STORE sub-operation on the remote AE SCP. This will start an Instance transfer from remote Storage SCU to the system’s Storage AE SCP.

Furthermore, the SCU Services may issue relational queries, if supported by the remote Query/Retrieve SCP node and requested by the querying Application. The same set of keys are used as in the Study Root Query Model.

syngo CT leaves the Association for the C-MOVE-RQ from the SCU side open until all requested data has arrived.

syngo CT provides the possibility to configure how the decision about the completeness of the received data is made.

syngo CT supports on the SCP side the Patient Root Query Information Model, Study Root Query Information Model and the retired Patient/Study Only Query Information Model. On the SCU side, only the Study Root Query/Retrieve Information Model is supported.

syngo CT DICOM Query/Retrieve SCP accepts C-FIND-RQ, queries the local database based on the provided Key Attributes and returns the matches in the C-FIND-RSPs. Depending on further request from the remote Query/Retrieve SCU, syngo CT responds to C-MOVE-RQs by initiating a C-STORE sub-operation to send image objects to the Storage SCP of the querying system.

4.1.5 Functional Definition of Modality Worklist AE

syngo CT Modality Worklist SCU issues DICOM Modality Worklist requests using C-FIND-RQs. The results in the C-FIND-RSPs are stored in internal database. The provided Patient and Procedure information is used for patient registration prior to starting an exam.

4.1.6 Functional Definition of Modality Performed Procedure Step AE

syngo CT MPPS SCU uses the N-CREATE-RQ to inform an Information System that a procedure step is IN PROGRESS.

syngo CT MPPS SCU uses the N-SET-RQ to inform the Information System about the finalization of the Procedure Step, using either a status of COMPLETED or DISCONTINUED.

4.1.7 Functional Definition of Print AE

The SCU of the Print AE of syngo CT is invoked by the user interface to setup film-sheet layout and whenever an image is ready to be printed on film. The Print SCU will hold and maintain all data needed to compile a complete film-sheet from the data (images, layout, configuration) received. Whenever a film-sheet is ready to print, the related data is used to supply the Information to the SOP Classes of the Print Management Service Class. A queue is maintained to intermediately store several film-sheets in case of resource problems on printer. The SCU will only supply and require the mandatory SOP Classes of the Print Management Service Class.

4.1.8 Functional Definition of Media AE

syngo CT Media AE provides the functionality to Import or Export SOP Instances from and into the File System:

- providing browsing windows for Import from and Export to the File System
- creating a new File-set into the File System (Export to ...)
- importing SOP Instances from the medium onto local Storage
- during export, a DICOMDIR may also be generated (user selection)
- writing the File-set's DICOMDIR information into the file system and joining it to an ISO image
- a complete ISO Image ready-to-burn can also be generated.

5 Service and Interoperability Description

5.1 Mapping of Services to Application Entities

Table 5.1-1 provides an overview of the Application Entities and the Services supported by each AE.

Table 5.1-1 Service to AE Mapping

Application Entity	Supported Services	Role								
		DIMSE		DICOM Web		DICOM Media			Real-Time Video	
		SCU	SCP	Origin Server	User Agent	FSC	FSU	FSR	SCU	SCP
Storage	Storage	Y	Y							
Storage Commitment	Storage Commitment	Y	N							
Query/Retrieve	Query/Retrieve	Y	Y							
Modality Worklist	Basic Worklist Management	Y	N							
Modality Performed Procedure Step	Modality Performed Procedure Step	Y	N							
Print	Print Management	Y	N							
Media Storage						Y	Y	Y		

5.2 Supported DIMSE Services

5.2.1 Basic Worklist Management Service

5.2.1.1 SCU of the Modality Worklist Information Model – FIND SOP Class

As a Service Class User of the Modality Worklist Information Model – FIND SOP Class, syngo CT uses the C-FIND-RQ message to query the SCP. It supports the Query Keys listed in Table 5.2-1.

In the “Matching Type” column, the following values can be used:

- SINGLE_VALUE: SCU can request Single Value Matching on this Attribute.
- UID: SCU can request List of UID Matching on this Attribute.
- WILDCARD: SCU can request Wild Card Matching on this Attribute.
- RANGE: SCU can request Range Matching on this Attribute.
- SEQUENCE: SCU can request Sequence Matching on this Attribute.
- UNIVERSAL: SCU can request Attribute as a return value (Universal Matching).

In the “Query Value Source” column, the following values can be used:

- FIXED: The value cannot be modified by the user or by configuration.
- GENERATED: The value is generated by the system (e.g. current date as the study date).

- CONFIGURATION: The value is dependent on system configuration.
- USER: The value is entered by the user.
- SCANNED: The value is read from a barcode scanner or similar device.
- EMPTY: The value is left empty to indicate it is a Return Key only.

In the "Display on UI" column the following values can be used:

- D: the return value is displayed on the main UI by default.
- C: the return value is displayed on the main UI if configured.
- N: the return value is never displayed.

Table 5.2-1 Supported C-FIND Query Parameters for Modality Worklist - SCU

Attribute Name	Tag	Matching Type	Query Value Source	Value	Display on UI	Comments
Scheduled Procedure Step						
Schedule Procedure Step Sequence	(0040,0100)	SEQUENCE	GENERATED		N	
>Modality	(0008,0060)	SINGLE_VALUE	USER		D	
>Scheduled Station AE Title	(0040,0001)	WILDCARD	USER		D	An * is always added at the end of the search string
>Scheduled Procedure Step Status	(0040,0020)	SINGLE_VALUE	USER		D	
>Scheduled Procedure Step Location	(0040,0011)	UNIVERSAL	EMPTY		D	
>Scheduled Station Name	(0040,0010)	UNIVERSAL	EMPTY		D	
>Scheduled Performing Physician's Name	(0040,0006)	UNIVERSAL	USER		D	
>Scheduled Procedure Step Start Date	(0040,0002)	RANGE	USER		N	
>Scheduled Procedure Step Start Time	(0040,0003)	RANGE	USER		N	
>Scheduled Procedure Step End Date	(0040,0004)	UNIVERSAL	EMPTY		N	
>Scheduled Procedure Step End Time	(0040,0005)	UNIVERSAL	EMPTY		N	
>Scheduled Procedure Step Description	(0040,0007)	UNIVERSAL	EMPTY		N	
>Scheduled Protocol Code Sequence	(0040,0008)	UNIVERSAL	EMPTY		N	
>Scheduled Procedure Step ID	(0040,0009)	UNIVERSAL	EMPTY		N	
>Comments on the Scheduled Procedure Step	(0040,0400)	UNIVERSAL	EMPTY		N	
Requested Procedure						

Attribute Name	Tag	Matching Type	Query Value Source	Value	Display on UI	Comments
Requested Procedure Comments	(0040,1400)	WILDCARD	USER		D	An * is always added at the end of the search string
Patient Transport Arrangements	(0040,1004)	WILDCARD	USER		D	An * is always added at the end of the search string
Requested Procedure Priority	(0040,1003)	WILDCARD	USER		D	An * is always added at the end of the search string
Requested Procedure Sequence	(0032,1064)	SEQUENCE	GENERATED		N	
Requested Procedure Code Sequence	(0032,1064)	SINGLE_VALUE	USER		D	
Requested Procedure Description	(0032,1060)	WILDCARD	USER		D	An * is always added at the end of the search string
Referring Physician's Name	(0008,0090)	WILDCARD	USER		D	An * will be always added at the end of the search string.
Requesting Physician	(0032,1032)	WILDCARD	USER		D	An * is always added at the end of the search string
Study Date	(0008,0020)	UNIVERSAL	EMPTY		N	
Study Time	(0008,0030)	UNIVERSAL	EMPTY		N	
Referenced Study Sequence	(0008,1110)	UNIVERSAL	EMPTY		N	
>Referenced SOP Class UID	(0008,1150)	UNIVERSAL	EMPTY		N	
>Referenced SOP Instance UID	(0008,1155)	UNIVERSAL	EMPTY		N	
Study Instance UID	(0020,000D)	UNIVERSAL	EMPTY		N	
Requested Procedure ID	(0040,1001)	UNIVERSAL	EMPTY		N	
Reason for the Requested Procedure	(0040,1002)	UNIVERSAL	EMPTY		N	
Confidentiality Code	(0040,1008)	UNIVERSAL	EMPTY		N	
Reporting Priority	(0040,1009)	UNIVERSAL	EMPTY		N	
Names of intended Recipients of Results	(0040,1010)	UNIVERSAL	EMPTY		N	
Imaging Service Request						
Accession Number	(0008,0050)	WILDCARD	USER		D	An * will always be added at the end of the search string.

Attribute Name	Tag	Matching Type	Query Value Source	Value	Display on UI	Comments
Requesting Service	(0032,1033)	UNIVERSAL	EMPTY		N	
Admitting Diagnoses Description	(0008,1080)	UNIVERSAL	EMPTY		N	
Issuing Date of Imaging Service Request	(0040,2004)	UNIVERSAL	EMPTY		N	
Issuing Time of Imaging Service Request	(0040,2005)	UNIVERSAL	EMPTY		N	
Placer Order Number / Imaging Service Request	(0040,2016)	UNIVERSAL	EMPTY		N	
Filler Order Number / Imaging Service Request	(0040,2017)	UNIVERSAL	EMPTY		N	
Order entered by ...	(0040,2008)	UNIVERSAL	EMPTY		N	
Order Enterer's location	(0040,2009)	UNIVERSAL	EMPTY		N	
Order Callback Phone Number	(0040,2010)	UNIVERSAL	EMPTY		N	
Imaging Service Request Comments	(0040,2400)	UNIVERSAL	EMPTY		N	
Visit Identification						
Current Patient Location	(0038,0300)	WILDCARD	USER		D	An * will always be added at the end of the search string.
Admission ID	(0038,0010)	UNIVERSAL	EMPTY		N	
Institution Name	(0008,0080)	UNIVERSAL	EMPTY		N	
Institution Address	(0008,0081)	UNIVERSAL	EMPTY		N	
Issuer of Admission ID	(0038,0011)	UNIVERSAL	EMPTY		N	
Admitting Date	(0038,0020)	UNIVERSAL	EMPTY		N	
Visit Status						
Patient Identification						
Patient's Name	(0010,0010)	UNIVERSAL	EMPTY		N	
Patient ID	(0010,0020)	UNIVERSAL	EMPTY		N	
Issuer of Patient ID	(0010,0021)	UNIVERSAL	EMPTY		N	
Other Patient IDs	(0010,1000)	UNIVERSAL	EMPTY		N	
Other Patient Names	(0010,1001)	UNIVERSAL	EMPTY		N	
Patient's Birth Name	(0010,1005)	UNIVERSAL	EMPTY		N	
Patient Demographics						
Patient's Birth Date	(0010,0030)	UNIVERSAL	EMPTY		N	
Patient's Birth Time	(0010,0032)	UNIVERSAL	EMPTY		N	
Patient's Sex	(0010,0040)	UNIVERSAL	EMPTY		N	

Attribute Name	Tag	Matching Type	Query Value Source	Value	Display on UI	Comments
Patient's Insurance Plan Code Sequence	(0010,0050)	UNIVERSAL	EMPTY		N	
Patient's Age	(0010,1010)	UNIVERSAL	EMPTY		N	
Patient's Size	(0010,1020)	UNIVERSAL	EMPTY		N	
Patient's Weight	(0010,1030)	UNIVERSAL	EMPTY		N	
Patient's Address	(0010,1040)	UNIVERSAL	EMPTY		N	
Military Rank	(0010,1080)	UNIVERSAL	EMPTY		N	
Branch of Service	(0010,1081)	UNIVERSAL	EMPTY		N	
Ethnic Group	(0010,2160)	UNIVERSAL	EMPTY		N	
Patient Comments	(0010,4000)	UNIVERSAL	EMPTY		N	
Patient Medical						
Pregnancy Status	(0010,21C0)	SINGLE_VALUE	USER		D	
Medical Alerts	(0010,2000)	WILDCARD	USER		D	An * will always be added at the end of the search string.
Allergies	(0010,2110)	WILDCARD	USER		D	An * will always be added at the end of the search string.
Smoking Status	(0010,21A0)	UNIVERSAL	EMPTY		N	
Additional Patient History	(0010,21B0)	UNIVERSAL	EMPTY		N	
Last Menstrual Date	(0010,21D0)	UNIVERSAL	EMPTY		N	
Special Needs	(0038,0050)	UNIVERSAL	EMPTY		N	

The User can cancel any running Query. In this case C-CANCEL-FIND-RQ will be sent to the SCP. The processing of the data, which are received in the respective Association is stopped. The Association is closed if a Confirmation for the Cancelling is received as C-FIND-RSP, Status Cancel (FF00H), or if the Confirmation does not arrive in the Transfer Inactivity Timeout (see Table 6.1-1).

An automatic Modality Worklist Query can be configured from the Administration Portal.

In case of missing or invalid Type 1 DICOM attributes syngo CT will reject the content of the C-FIND-RSP message.

5.2.1.2 SCP of the Modality Worklist Information Model – FIND SOP Class

N/A

5.2.2 Modality Performed Procedure Step Service

5.2.2.1 SCU of the Modality Performed Procedure Step SOP Class

As a Service Class User of the Modality Performed Procedure Step SOP Class, syngo CT supports the Attributes listed in Table 5.2-2 in the N-CREATE-RQ and N-SET-RQ messages, if it creates the message.

In the "Source" column the following values can be used:

- FIXED: the value is pre-defined and cannot be modified.
- GENERATED: the value is generated by the system.
- CONFIGURATION: the value is copied from system configuration.
- MWL: the value is copied from modality worklist entry.
- USER: the value is entered by the user.
- SCANNED: the value is read from a barcode scanner or similar device.
- EMPTY: the Attribute is sent without value.

Table 5.2-2 Supported N-CREATE and N-SET Attributes for Modality Performed Procedure Step - SCU

Attribute Name	Tag	Source	Value N-CREATE	Value N-SET	Comments
Performed Procedure Step Relationship					
Referenced Patient Sequence	(0008,1120)	EMPTY	Empty	N/A	
Patient's Name	(0010,0010)	MWL;USER		N/A	
Patient ID	(0010,0020)	MWL;USER		N/A	
Issuer of Patient ID	(0010,0021)	MWL		N/A	
Patient's Birth Date	(0010,0030)	MWL;USER		N/A	
Patient's Sex	(0010,0040)	MWL;USER		N/A	
Scheduled Step Attributes Sequence	(0040,0270)	GENERATED		N/A	
>Accession Number	(0008,0050)	MWL		N/A	
>Referenced Study Sequence	(0008,1110)	MWL		N/A	
>>Referenced SOP Class UID	(0008,1150)	MWL		N/A	
>>Referenced SOP Instance UID	(0008,1155)	MWL		N/A	
>Study Instance UID	(0020,000D)	MWL		N/A	
>Requested Procedure Description	(0032,1060)	MWL		N/A	
>Scheduled Procedure Step Description	(0040,0007)	MWL		N/A	
>Scheduled Protocol Code Sequence	(0040,0008)	EMPTY	Empty	N/A	
>Scheduled Procedure Step ID	(0040,0009)	MWL		N/A	
>Requested Procedure ID	(0040,1001)	MWL		N/A	

Attribute Name	Tag	Source	Value N-CREATE	Value N-SET	Comments
Performed Procedure Step Information					
Procedure Code Sequence	(0008,1032)	MWL			*Value is always taken from (0032,1064) Requested Procedure Code Sequence*
>Code Value	(0008,0100)	MWL			
>Coding Scheme Designator	(0008,0102)	MWL			
>Coding Scheme Version	(0008,0103)	MWL			
>Code Meaning	(0008,0104)	MWL			
Performed Station AE Title	(0040,0241)	CONFIGURATION		N/A	
Performed Station Name	(0040,0242)	CONFIGURATION	Copied from 'Ward' in configuration	N/A	
Performed Location	(0040,0243)	CONFIGURATION	Copied from 'Department' in configuration	N/A	
Performed Procedure Step Start Date	(0040,0244)	GENERATED		N/A	
Performed Procedure Step Start Time	(0040,0245)	GENERATED		N/A	
Performed Procedure Step End Date	(0040,0250)	GENERATED	Empty		
Performed Procedure Step End Time	(0040,0251)	GENERATED	Empty		
Performed Procedure Step Status	(0040,0252)	GENERATED	IN PROGRESS	DISCONTINUED; COMPLETED	
Performed Procedure Step ID	(0040,0253)	GENERATED		N/A	
Performed Procedure Step Description	(0040,0254)	MWL			Value is always taken from (0032,1060) Requested Procedure Description
Performed Procedure Type Description	(0040,0255)	EMPTY	Empty	Empty	
Performed Procedure Step Discontinuation Reason Code Sequence	(0040,0281)	GENERATED	Empty	See Table 5.2-3	Only available if the patient examination is closed before any scan has been performed.

Attribute Name	Tag	Source	Value N-CREATE	Value N-SET	Comments
>Code Value	(0008,0100)	GENERATED	N/A		
>Coding Scheme Designator	(0008,0102)	GENERATED	N/A		
>Coding Scheme Version	(0008,0103)	GENERATED	N/A		
>Code Meaning	(0008,0104)	GENERATED	N/A		
Image Acquisition Results					
Modality	(0008,0060)	GENERATED	CT	N/A	
Study ID	(0020,0010)	MWL;USER			Copied from Requested Procedure ID
Performed Protocol Code Sequence	(0040,0260)	EMPTY	Empty	Empty	
Performed Series Sequence	(0040,0340)	GENERATED	Empty		
>Retrieve AE Title	(0008,0054)	GENERATED	N/A	Empty	
>Series Description	(0008,103E)	GENERATED	N/A		
>Performing Physicians Name	(0008,1050)	MWL;USER	N/A		
>Operators' Name	(0008,1070)	USER	N/A		
>Referenced Image Sequence	(0008,1140)	GENERATED	N/A		
>>Referenced SOP Class UID	(0008,1150)	GENERATED	N/A		
>>Referenced SOP Instance UID	(0008,1155)	GENERATED	N/A		
>Protocol Name	(0018,1030)	GENERATED	N/A		
>Series Instance UID	(0020,000E)	GENERATED	N/A	1.3.12.2.1107.5.1.7. *+ serial number + part created per Series Instance*	
>Referenced Non-Image Composite SOP Instance Sequence	(0040,0220)	GENERATED	N/A		
>>Referenced SOP Class UID	(0008,1150)	GENERATED	N/A		

Attribute Name	Tag	Source	Value N-CREATE	Value N-SET	Comments
>>Referenced SOP Instance UID	(0008,1155)	GENERATED	N/A		
Radiation Dose					
Anatomic Structure, Space or Region Sequence	(0008,2229)	EMPTY	Empty	Empty	
Exposure Dose Sequence	(0040,030E)	EMPTY	Empty	Empty	
Billing and Material Management Code					
Film Consumption Sequence	(0040,0321)	EMPTY	Empty	Empty	
Billing Supplies and Devices Sequence	(0040,0324)	EMPTY	Empty	Empty	

Table 5.2-3 lists the supported Discontinuation Reasons for the Performed Procedure Step Discontinuation Reason Code Sequence (0040,0281) in case the Performed Procedure Step Status is set to DISCONTINUED:

Table 5.2-3 PPS Discontinuation Reasons

Coding Scheme Designator	Code Value	Code Meaning
DCM	110500	Doctor cancelled procedure

N-CREATE is sent as soon as the patient examination has been started.

N-SET with Performed Procedure Step Status (0040,0252) = COMPLETED is sent as soon as the image acquisition workflow has been closed and all started reconstruction jobs of this acquisition have been performed.

N-SET with Performed Procedure Step Status (0040,0252) = DISCONTINUED is sent when the patient examination is closed before performing any scan.

5.2.2.2 SCP of the Modality Performed Procedure Step SOP Class

N/A

5.2.3 Unified Procedure Step Service

N/A

5.2.4 Instance Availability Notification Service

N/A

5.2.5 Storage Service

5.2.5.1 SCU of the Storage SOP Classes

As a Service Class User of the Storage Service Class, syngo CT uses the C-STORE-RQ message to request storage of SOP Instances by a remote AE. See Section 1.1 Content and Transfer in the Overview for the list of supported SOP Classes.

For details regarding the content of SOP Instances that are created by the system, see Annex A, which describes the underlying IOD of the supported SOP Classes.

5.2.5.1.1 Transcoding of Transfer Syntaxes

Table 5.2-4 Transcoding of Transfer Syntaxes describes supported transcodings between the locally stored encoding of SOP Instances and the negotiated Transfer Syntax. The following values can be used:

- SUPPORTED: Transcoding is possible and same SOP Instance UID is re-used.
- NEW_UID: Transcoding is possible; however a new SOP Instance is created for transfer, e.g. due to lossy compression.
- NOT_SUPPORTED: Transcoding is not possible.

Table 5.2-4 Transcoding of Transfer Syntaxes

Sent Transfer Syntax / Stored Transfer Syntax	Implicit VR Little Endian	Explicit VR Little Endian	Explicit VR Big Endian	JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14)	JPEG Lossless, Non-Hierarchical (Processes 14)	JPEG 2000 Image Compression (Lossless Only)	RLE Lossless	JPEG Extended (Process 2 & 4)	JPEG Baseline (Process 1)	JPEG 2000 Image Compression
Implicit VR Little Endian		SUPPORTED	NEW_UID	NEW_UID	NEW_UID	NEW_UID	NEW_UID	NEW_UID	NEW_UID	NEW_UID
Explicit VR Little Endian	SUPPORTED		SUPPORTED	SUPPORTED	SUPPORTED	SUPPORTED	SUPPORTED	SUPPORTED	SUPPORTED	SUPPORTED
Explicit VR Big Endian	NEW_UID	SUPORTED		SUPPORTED	SUPPORTED	SUPPORTED	SUPPORTED	SUPPORTED	SUPPORTED	SUPPORTED
JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14)	NEW_UID	SUPPORTED	SUPPORTED		SUPPORTED	SUPPORTED	SUPPORTED	SUPPORTED	SUPPORTED	SUPPORTED
JPEG Lossless, Non-Hierarchical (Processes 14)	NEW_UID	SUPPORTED	SUPPORTED	SUPPORTED		SUPPORTED	SUPPORTED	SUPPORTED	SUPPORTED	SUPPORTED

Sent Transfer Syntax / Stored Transfer Syntax	Implicit VR Little Endian	Explicit VR Little Endian	Explicit VR Big Endian	JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14)	JPEG Lossless, Non-Hierarchical (Processes 14)	JPEG 2000 Image Compression (Lossless Only)	RLE Lossless	JPEG Extended (Process 2 & 4)	JPEG Baseline (Process 1)	JPEG 2000 Image Compression
JPEG 2000 Image Compression (Lossless Only)	NEW_UID	SUPPORTED	SUPPORTED	SUPPORTED	SUPPORTED		SUPPORTED	SUPPORTED	SUPPORTED	SUPPORTED
RLE Lossless	NEW_UID	SUPPORTED	SUPPORTED	SUPPORTED	SUPPORTED	SUPPORTED		SUPPORTED	SUPPORTED	SUPPORTED
JPEG Extended (Process 2 & 4)	NEW_UID	NEW_UID	NEW_UID	NEW_UID	NEW_UID	NEW_UID	NEW_UID		NOT_ SUPPORTED[1)]	NEW_UID
JPEG Baseline (Process 1)	NEW_UID	NEW_UID	NEW_UID	NEW_UID	NEW_UID	NEW_UID	NEW_UID	NOT_ SUPPORTED[1)]		NEW_UID
JPEG 2000 Image Compression	NEW_UID	NEW_UID	NEW_UID	NEW_UID	NEW_UID	NEW_UID	NEW_UID	NEW_UID	SUPPORTED	

[1)] JPEG Baseline (Process 1) is made for 8 Bit images, JPEG Extended (Process 2 & 4) is made for 12 Bit images. Since the same image cannot be 8 Bit and 12 Bit, the two compression algorithms are not compatible. As such, not every image undergoes every kind of transcoding. Using only lossy compression may result in incorrect diagnosis due to insufficient image quality.

Every transcoding is noted in the DICOM Data in the Attributes (0008,2111) Derivation Description and (0008,2112) Source Image Sequence.

5.2.5.2 SCP of the Storage SOP Classes

As a Service Class Provider of the Storage Service Class, syngo CT receives the C-STORE-RQ message from remote SCUs. See Section 1.1 Content and Transfer in the Overview for the list of supported SOP Classes.

Table 5.2-5 defines the conformance levels of syngo CT.

Table 5.2-5 Levels of Conformance

Level of Storage Support	2[1)]
Level of Digital Signature Support	N/A

[1)] The level of Conformance is by default 2, however the user has the possibility to configure Header Correction Rulesets, which contains deletion. If such a Header Correction Ruleset is selected, the Level of Conformance is 0 (Local).

Table 5.2-6 lists any limitations on displaying or processing Instances, e.g., display or processing of the respective SOP Instances is prevented by an unsupported value for an Attribute or the absence of that Attribute.

The "Effect" column describes what happens if the limitation is encountered. The following values are used:

- ND: Display is not possible
- LD: Display is limited
- NP: Processing is not possible
- LP: Processing is limited
- OT: Other effects described in the "Comments" column.

Table 5.2-6 Display and Processing Limitations for Storage SCP

Limitation Case			Effect	Comments
Attribute Name	*Tag*	*Value*		
No restriction to display or post processing apply.				

Table 5.2-7 lists actions performed upon receiving Instances from a remote AE and system behavior when certain conditions are encountered.

Table 5.2-7 Behavior when storing Instances

Action upon Receiving	Condition	System behavior
Perform Attribute Validation	Minor DICOM inconsistencies	In case Character Set Mismatches mismatching characters are replaced with ?.
	Duplicate Instance	Duplicate Instances are ignored. The processing continues with the next Instance.
	DICOM Validation error	The Association is aborted.
	Success	Instances are stored in internal database.
Add to an existing study	Mismatch in patient identifying information detected	No exception queue is supported. In case of a PII match, the newly received data will be added to the respective patient, otherwise a new patient will be created.
	Success	Instances are stored in local database.
Localize Patient Information	Patient mismatch detected	A new patient is created.
	Success	Original patient identity information is copied to Other Patient IDs (0010,1000)

Action upon Receiving	Condition	System behavior
		Instances are stored in internal database.
Coerce non-patient-identifying Attributes	Success	Original values of coerced Attributes are copied to Original Attributes Sequence (0040,0561). Instances are stored in local database.

A compression can be enforced by storing Instances by Transfer Syntax exclusion on the Administration Portal.

Table 5.2-8 describes how the SCP handles compression for stored Instances.

The following values are used in the “Behavior” column:

- AS_IS: Images are stored as received.
- CONFIGURATION: Images are compressed based on internal configuration settings.
- OTHER: All other conditions, which are further described in the “Comments” column.

The Transfer Syntax is used to describe the compression mechanism applied.

Table 5.2-8 Image Compression by Storage SCP

SOP Class	Behavior	Transfer Syntax	Comments
All Supported SOP Classes (except for Media Storage Directory Storage - 1.2.840.10008.1.3.10)	CONFIGURATION	Following Compressions can be configured as available Transfer Syntaxes for all the SOP Classes. Beside configuring them as available, any of them or any combination of them can be also enforced for certain SOP Classes. Please note, that the DICOM Objects may or may not be compatible with the enforced Compressions, depending on the values of their defined Attributes (for further details see **Transfer Syntax Selection Policies**). If the DICOM Object is not compatible with the enforced Compression, the Storage Operation will fail. Following Compression algorithms are supported: JPEG Baseline (Process 1), UID: 1.2.840.10008.1.2.4.50 JPEG Extended (Process 2 & 4), UID: 1.2.840.10008.1.2.4.51 JPEG Lossless, Non-Hierarchical (Process 14) , UID: 1.2.840.10008.1.2.4.57 JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14 [Selection Value 1]) , UID: 1.2.840.10008.1.2.4.70 JPEG 2000 Image Compression (Lossless Only) , UID: 1.2.840.10008.1.2.4.90 JPEG 2000 Image Compression, UID: 1.2.840.10008.1.2.4.91 RLE Lossless, UID: 1.2.840.10008.1.2.5	

Excluding for the SCP side each non compressed Transfer Syntaxes will result in a mandatory compression of all received data. If for the received data none of the compression algorithms are applicable, the network transfer will fail

.

5.2.5.3 Attribute Coercion

It is possible to configure Attribute Coercion for the remote AEs, both for SCU (Attribute Coercion for the data received from the *remote SCU*) and SCP (Attribute Coercion before sending the data to the *remote SCP*) side.

syngo CT coerces the Attributes listed in Table 5.2-9 before sending them to other systems or upon receiving them from other systems.

syngo CT offers the user an extendable list of Header Correction Rulesets. The very same set can be applied on the SCP and SCU Side.

Header Correction Ruleset can be added, removed and changed. No re-installation is required.

Beside the corrections that needs to be done, pre-conditions can be defined for the operations performed on Attributes.

The "SOP Class UID" column indicates whether the coercion is applicable to specific SOP Classes or to "ALL" SOP Classes. syngo CT only provides correction rules for ALL SOP Classes. A restriction to specific SOP Classes is not supported.

The "Type of Change" column defines the coercion done to the Attributes, the following values can be used:

- MODIFIED: The value of the Attribute is changed; the new value is described in the "New Value" column.
- ADDED: The Attribute is added with the value defined in the "New Value" column.
- REMOVED: That Attribute is completely removed from the Instance.

The "Condition" column defines the condition under which coercion is performed. The following values can be used:

- ALWAYS: Data coercion is performed on each Instance of the specified SOP Class that is sent or received by the system.
- EXTERNAL: Data coercion is performed on Instances sent to or received from systems external to the institution.
- CONFIGURATION: Data coercion is performed based on system configuration.
- OTHER: Data coercion is performed for other conditions. Details are defined in the "Comments" column.

Table 5.2-9, Table 5.2-10, Table 5.2-11, Table 5.2-12, Table 5.2-13 and Table 5.2-14 describe the standard set of the Header Correction Rules provided.

The names of the Header Correction Sets, included between quotation marks, is the name the Service Technician can select by configuring the Storage Service behavior for Remote DICOM Nodes.

By default no Header Correction Rule Set is applied. The selection of the applicable Header Correction Rule Set is performed by the user. Not all Rule Sets should be applied to all kinds of data. This Document provides a detailed description of the capabilities and features of each Header Correction Rule Set. It is the responsibility of the Service Technician to apply the correct one for the respective operation.

Different Header Correction Rule Sets may handle the same Attribute in different ways.

The Service Technician can select one or more Header Correction Rule Sets to be applied to the data transferred. In this case they are applied sequentially, in alphabetical order of their name.

The syntagm "Standard" in "Standard Header Correction Ruleset" means, that this is delivered with the product. The Service Technician can create and apply additional Header Correction Rulesets. All Header Correction Rules described below are delivered with the product.

Please note: The following Header Correction Rule Sets are meant to be used to improve interoperability with third party Products, that are not fully DICOM Conform. They are meant to correct erroneous and non-conform incoming

SOP Instances to make them DICOM Conform and adjust outgoing SOP Instances, to make third party Products able to accept them.

Table 5.2-9 Standard Header Correction Set *"Handle Acquisition Time"*

Attribute Name	Tag	SOP Class UID	Type of Change	New Value	Condition	Comments
Acquisition Time	(0008,0032)	ALL	ADDED; MODIFIED	Current Date and Time	OTHER	Added, if the Attribute is missing. Modified, if the Attribute does not have any value.

Table 5.2-10 Standard Header Correction Set *"Handle Patient's Age"*

Attribute Name	Tag	SOP Class UID	Type of Change	New Value	Condition	Comments
Patient's Age	(0010,1010)	ALL	MODIFIED	Age String (AS) VR compatible value.	ALWAYS	

Table 5.2-11 Standard Header Correction Set *"Handle Patient's Sex"*

Attribute Name	Tag	SOP Class UID	Type of Change	New Value	Condition	Comments
Patient's Sex	(0010,0040)	ALL	MODIFIED	The values expected by the DICOM Standard	OTHER	This is configured to replace standard values written in small case or to replace nonstandard values (such as w or W for female in German).

Table 5.2-12 Standard Header Correction Set *"Handle Patient's Weight and Size"*

Attribute Name	Tag	SOP Class UID	Type of Change	New Value	Condition	Comments
Patient's Size	(0010,1020)	ALL	REMOVED		OTHER	The Attribute is removed if its value is 0 with a tolerance of +/- 0.1 (invalid value).
Patient's Weight	(0010,1030)	ALL	REMOVED		OTHER	The Attribute is removed if its value is 0 with a tolerance of +/- 0.1 (invalid value).

Table 5.2-13 Standard Header Correction Set *"Remove All Private Data Elements (Tag Based)"* [1)]

Attribute Name	Tag	SOP Class UID	Type of Change	New Value	Condition	Comments
Instance Coercion DateTime	(0008,0015)	ALL	REMOVED		ALWAYS	
Study Date	(0008,0020)	ALL	MODIFY	Current Date	ALWAYS	
Series Date	(0008,0021)	ALL	MODIFY	Current Date	ALWAYS	
Acquisition Date	(0008,0022)	ALL	MODIFY	Current Date	ALWAYS	
Content Date	(0008,0023)	ALL	MODIFY	Current Date	ALWAYS	
Overlay Date	(0008,0024)	ALL	REMOVED		ALWAYS	Retired
Curve Date	(0008,0025)	ALL	REMOVED		ALWAYS	Retired
Acquisition DateTime	(0008,002A)	ALL	MODIFY	Current Date and Time	ALWAYS	
Study Time	(0008,0030)	ALL	MODIFY	Current Time	ALWAYS	
Acquisition Time	(0008,0032)	ALL	MODIFY	Current Time	ALWAYS	
Content Time	(0008,0033)	ALL	MODIFY	Current Time	ALWAYS	
Overlay Time	(0008,0034)	ALL	REMOVED		ALWAYS	Retired
Curve Time	(0008,0035)	ALL	REMOVED		ALWAYS	Retired
Accession Number	(0008,0050)	ALL	MODIFY	Empty Value	OTHER	If the Attribute has a value
Institution Name	(0008,0080)	ALL	MODIFY	Empty Value	OTHER	If the Attribute has a value
Institution Address	(0008,0081)	ALL	REMOVED		ALWAYS	
Institution Code Sequence	(0008,0082)	ALL	REMOVED		ALWAYS	
Referring Physician's Name	(0008,0090)	ALL	MODIFY	Empty Value	OTHER	If the Attribute has a value
Referring Physician's Address	(0008,0092)	ALL	REMOVED		ALWAYS	
Referring Physician's Telephone Numbers	(0008,0094)	ALL	REMOVED		ALWAYS	
Referring Physician Identification Sequence	(0008,0096)	ALL	REMOVED		ALWAYS	
Timezone Offset From UTC	(0008,0201)	ALL	REMOVED		ALWAYS	
Study Description	(0008,1030)	ALL	REMOVED		ALWAYS	
Series Description	(0008,103E)	ALL	REMOVED		ALWAYS	
Institutional Department Name	(0008,1040)	ALL	REMOVED		ALWAYS	
Physician(s) of Record	(0008,1048)	ALL	REMOVED		ALWAYS	
Physician(s) of Record Identification Sequence	(0008,1049)	ALL	REMOVED		ALWAYS	
Performing Physician's Name	(0008,1050)	ALL	REMOVED		ALWAYS	

Attribute Name	Tag	SOP Class UID	Type of Change	New Value	Condition	Comments
Performing Physician Identification Sequence	(0008,1052)	ALL	REMOVED		ALWAYS	
Name of Physician(s) Reading Study	(0008,1060)	ALL	REMOVED		ALWAYS	
Physician(s) Reading Study Identification Sequence	(0008,1062)	ALL	REMOVED		ALWAYS	
Operators' Name	(0008,1070)	ALL	MODIFIED	Empty Value	OTHER	If the Attribute has a value
Operator Identification Sequence	(0008,1072)	ALL	REMOVED		ALWAYS	
Admitting Diagnoses Description	(0008,1080)	ALL	REMOVED		ALWAYS	
Admitting Diagnoses Code Sequence	(0008,1084)	ALL	REMOVED		ALWAYS	
Referenced Study Sequence	(0008,1110)	ALL	REMOVED		ALWAYS	
Referenced Performed Procedure Step Sequence	(0008,1111)	ALL	REMOVED		ALWAYS	
Referenced Patient Sequence	(0008,1120)	ALL	REMOVED		ALWAYS	
Referenced Image Sequence	(0008,1140)	ALL	REMOVED		ALWAYS	
Derivation Description	(0008,2111)	ALL	REMOVED		ALWAYS	
Source Image Sequence	(0008,2112)	ALL	REMOVED		ALWAYS	
Identifying Comments	(0008,4000)	ALL	REMOVED		ALWAYS	Retired
Patient's Name	(0010,0010)	ALL	MODIFIED	Empty Value	OTHER	If the Attribute has a value
Patient ID	(0010,0020)	ALL	MODIFIED	Empty Value	OTHER	If the Attribute has a value
Issuer of Patient ID	(0010,0021)	ALL	REMOVED		ALWAYS	
Patient's Birth Date	(0010,0030)	ALL	MODIFIED	The current Date	ALWAYS	
Patient's Sex	(0010,0040)	ALL	MODIFIED	O	OTHER	If the Attribute has a value
Patient's Insurance Plan Code Sequence	(0010,0050)	ALL	REMOVED		ALWAYS	
Patient's Primary Language Code Sequence	(0010,0101)	ALL	REMOVED		ALWAYS	
Patient's Primary Language Modifier Code Sequence	(0010,0102)	ALL	REMOVED		ALWAYS	
Other Patient IDs	(0010,1000)	ALL	REMOVED		ALWAYS	Retired

Attribute Name	Tag	SOP Class UID	Type of Change	New Value	Condition	Comments
Other Patient Names	(0010,1001)	ALL	REMOVED		ALWAYS	
Other Patient IDs Sequence	(0010,1002)	ALL	REMOVED		ALWAYS	
Patient's Birth Name	(0010,1005)	ALL	REMOVED		ALWAYS	
Patient's Age	(0010,1010)	ALL	REMOVED		ALWAYS	
Patient's Size	(0010,1020)	ALL	REMOVED		ALWAYS	
Patient's Weight	(0010,1030)	ALL	REMOVED		ALWAYS	
Patient's Address	(0010,1040)	ALL	REMOVED		ALWAYS	
Insurance Plan Identification	(0010,1050)	ALL	REMOVED		ALWAYS	
Patient's Mother's Birth Name	(0010,1060)	ALL	REMOVED		ALWAYS	
Military Rank	(0010,1080)	ALL	REMOVED		ALWAYS	
Branch of Service	(0010,1081)	ALL	REMOVED		ALWAYS	
Medical Record Locator	(0010,1090)	ALL	REMOVED		ALWAYS	Retired
Referenced Patient Photo Sequence	(0010,1100)	ALL	REMOVED		ALWAYS	
Medical Alerts	(0010,2000)	ALL	REMOVED		ALWAYS	
Allergies	(0010,2110)	ALL	REMOVED		ALWAYS	
Country of Residence	(0010,2150)	ALL	REMOVED		ALWAYS	
Region of Residence	(0010,2152)	ALL	REMOVED		ALWAYS	
Patient's Telephone Numbers	(0010,2154)	ALL	REMOVED		ALWAYS	
Ethnic Group	(0010,2160)	ALL	REMOVED		ALWAYS	
Occupation	(0010,2180)	ALL	REMOVED		ALWAYS	
Smoking Status	(0010,21A0)	ALL	REMOVED		ALWAYS	
Additional Patient History	(0010,21B0)	ALL	REMOVED		ALWAYS	
Pregnancy Status	(0010,21C0)	ALL	REMOVED		ALWAYS	
Last Menstrual Date	(0010,21D0)	ALL	REMOVED		ALWAYS	
Patient's Religious Preference	(0010,21F0)	ALL	REMOVED		ALWAYS	
Patient's Sex Neutered	(0010,2203)	ALL	MODIFIED	Empty Value	OTHER	If the Attribute has a value
Responsible Person	(0010,2297)	ALL	REMOVED		ALWAYS	
Responsible Organization	(0010,2299)	ALL	REMOVED		ALWAYS	
Patient Comments	(0010,4000)	ALL	REMOVED		ALWAYS	
Patient Identity Removed	(0012,0062)	ALL	MODIFIED	YES	ALWAYS	
De-identification Method	(0012,0063)	ALL	ADDED	Deidentified\Basic	ALWAYS	

Attribute Name	Tag	SOP Class UID	Type of Change	New Value	Condition	Comments
				Application Confidentiality Profile applied		
De-identification Method Code Sequence	(0012,0064)	ALL	ADDED	(0008,0100) set to 113100 (0008,0102) set to "DCM" (0008,0104) set to Basic Application Confidentiality Profile	ALWAYS	
Contrast/Bolus Agent	(0018,0010)	ALL	MODIFIED	DeIdentified	OTHER	If the Attribute has a value
Device Serial Number	(0018,1000)	ALL	MODIFIED	DeIdentified	OTHER	If the Attribute has a value
Plate ID	(0018,1004)	ALL	REMOVED		ALWAYS	
Generator ID	(0018,1005)	ALL	REMOVED		ALWAYS	
Cassette ID	(0018,1007)	ALL	REMOVED		ALWAYS	
Gantry ID	(0018,1008)	ALL	REMOVED		ALWAYS	
Protocol Name	(0018,1030)	ALL	MODIFIED	DeIdentified	OTHER	If the Attribute has a value
Acquisition Device Processing Description	(0018,1400)	ALL	MODIFIED	DeIdentified	OTHER	If the Attribute has a value
Acquisition Comments	(0018,4000)	ALL	REMOVED		ALWAYS	Retired
Detector ID	(0018,700A)	ALL	MODIFIED	DeIdentified	OTHER	If the Attribute has a value
Acquisition Protocol Description	(0018,9424)	ALL	REMOVED		ALWAYS	
Start Acquisition DateTime	(0018,9516)	ALL	MODIFY	Current Date and Time	ALWAYS	
End Acquisition DateTime	(0018,9517)	ALL	MODIFY	Current Date and Time	ALWAYS	
Contribution Description	(0018,A003)	ALL	REMOVED		ALWAYS	
Study ID	(0020,0010)	ALL	MODIFIED	Empty Value	OTHER	If the Attribute has a value
Modifying Device ID	(0020,3401)	ALL	REMOVED		ALWAYS	Retired
Modifying Device Manufacturer	(0020,3404)	ALL	REMOVED		ALWAYS	Retired
Modified Image Description	(0020,3406)	ALL	REMOVED			Retired
Image Comments	(0020,4000)	ALL	REMOVED		ALWAYS	
Frame Comments	(0020,9158)	ALL	REMOVED		ALWAYS	
Image Presentation Comments	(0028,4000)	ALL	REMOVED		ALWAYS	Retired
Study ID Issuer	(0032,0012)	ALL	REMOVED		ALWAYS	Retired

Attribute Name	Tag	SOP Class UID	Type of Change	New Value	Condition	Comments
Scheduled Study Location	(0032,1020)	ALL	REMOVED		ALWAYS	Retired
Scheduled Study Location AE Title	(0032,1021)	ALL	REMOVED		ALWAYS	Retired
Reason for Study	(0032,1030)	ALL	REMOVED		ALWAYS	Retired
Requesting Physician	(0032,1032)	ALL	REMOVED		ALWAYS	
Requesting Service	(0032,1033)	ALL	REMOVED		ALWAYS	
Requested Procedure Description	(0032,1060)	ALL	MODIFIED	Empty Value	OTHER	If the Attribute has a value
Requested Contrast Agent	(0032,1070)	ALL	REMOVED		ALWAYS	
Study Comments	(0032,4000)	ALL	REMOVED		ALWAYS	Retired
Referenced Patient Alias Sequence	(0038,0004)	ALL	REMOVED		ALWAYS	
Admission ID	(0038,0010)	ALL	REMOVED		ALWAYS	
Issuer of Admission ID	(0038,0011)	ALL	REMOVED		ALWAYS	Retired
Scheduled Patient Institution Residence	(0038,001E)	ALL	REMOVED		ALWAYS	Retired
Admitting Date	(0038,0020)	ALL	REMOVED		ALWAYS	
Admitting Time	(0038,0021)	ALL	REMOVED		ALWAYS	
Discharge Diagnosis Description	(0038,0040)	ALL	REMOVED		ALWAYS	Retired
Special Needs	(0038,0050)	ALL	REMOVED		ALWAYS	
Service Episode ID	(0038,0060)	ALL	REMOVED		ALWAYS	
Issuer of Service Episode ID	(0038,0061)	ALL	REMOVED		ALWAYS	Retired
Service Episode Description	(0038,0062)	ALL	REMOVED		ALWAYS	
Current Patient Location	(0038,0300)	ALL	REMOVED		ALWAYS	
Patient's Institution Residence	(0038,0400)	ALL	REMOVED		ALWAYS	
Patient State	(0038,0500)	ALL	REMOVED		ALWAYS	
Visit Comments	(0038,4000)	ALL	REMOVED		ALWAYS	
Scheduled Station AE Title	(0040,0001)	ALL	REMOVED		ALWAYS	
Scheduled Procedure Step Start Date	(0040,0002)	ALL	REMOVED		ALWAYS	
Scheduled Procedure Step Start Time	(0040,0003)	ALL	REMOVED		ALWAYS	
Scheduled Procedure Step End Date	(0040,0004)	ALL	REMOVED		ALWAYS	

Attribute Name	Tag	SOP Class UID	Type of Change	New Value	Condition	Comments
Scheduled Procedure Step End Time	(0040,0005)	ALL	REMOVED		ALWAYS	
Scheduled Performing Physician's Name	(0040,0006)	ALL	REMOVED		ALWAYS	
Scheduled Procedure Step Description	(0040,0007)	ALL	REMOVED		ALWAYS	
Scheduled Performing Physician Identification Sequence	(0040,000B)	ALL	REMOVED		ALWAYS	
Scheduled Station Name	(0040,0010)	ALL	REMOVED		ALWAYS	
Scheduled Procedure Step Location	(0040,0011)	ALL	REMOVED		ALWAYS	
Pre-Medication	(0040,0012)	ALL	REMOVED		ALWAYS	
Performed Station AE Title	(0040,0241)	ALL	REMOVED		ALWAYS	
Performed Station Name	(0040,0242)	ALL	REMOVED		ALWAYS	
Performed Location	(0040,0243)	ALL	REMOVED		ALWAYS	
Performed Procedure Step Start Date	(0040,0244)	ALL	REMOVED		ALWAYS	
Performed Procedure Step End Date	(0040,0250)	ALL	REMOVED		ALWAYS	
Performed Procedure Step End Time	(0040,0251)	ALL	REMOVED		ALWAYS	
Performed Procedure Step ID	(0040,0253)	ALL	REMOVED		ALWAYS	
Performed Procedure Step Description	(0040,0254)	ALL	REMOVED		ALWAYS	
Request Attributes Sequence	(0040,0275)	ALL	REMOVED		ALWAYS	
Comments on the Performed Procedure Step	(0040,0280)	ALL	REMOVED		ALWAYS	
Requested Procedure ID	'(0040,1001)	ALL	REMOVED		ALWAYS	
Patient Transport Arrangements	(0040,1004)	ALL	REMOVED		ALWAYS	
Requested Procedure Location	(0040,1005)	ALL	REMOVED		ALWAYS	
Names of Intended Recipients of Results	(0040,1010)	ALL	REMOVED		ALWAYS	

Attribute Name	Tag	SOP Class UID	Type of Change	New Value	Condition	Comments
Intended Recipients of Results Identification Sequence	(0040,1011)	ALL	REMOVED		ALWAYS	
Person Identification Code Sequence	(0040,1101)	ALL	REMOVED		ALWAYS	
Person's Address	(0040,1102)	ALL	REMOVED		ALWAYS	
Person's Telephone Numbers	(0040,1103)	ALL	REMOVED		ALWAYS	
Requested Procedure Comments	(0040,1400)	ALL	REMOVED		ALWAYS	
Reason for the Imaging Service Request	(0040,2001)	ALL	REMOVED		ALWAYS	Retired
Order Entered By	(0040,2008)	ALL	REMOVED		ALWAYS	
Order Enterer's Location	(0040,2009)	ALL	REMOVED		ALWAYS	
Order Callback Phone Number	(0040,2010)	ALL	REMOVED		ALWAYS	
Placer Order Number / Imaging Service Request	(0040,2016)	ALL	MODIFIED	Empty Value	OTHER	If the Attribute has a value
Filler Order Number / Imaging Service Request	(0040,2017)	ALL	MODIFIED	Empty Value	OTHER	If the Attribute has a value
Scheduled Procedure Step Start DateTime	(0040,4005)	ALL	REMOVED		ALWAYS	
Scheduled Procedure Step Modification DateTime	(0040,4010)	ALL	REMOVED		ALWAYS	
Expected Completion DateTime	(0040,4011)	ALL	REMOVED		ALWAYS	
Verifying Organization	(0040,A027)	ALL	REMOVED		ALWAYS	
Performed Station Name Code Sequence	(0040,4028)	ALL	REMOVED		ALWAYS	
Human Performer's Name	(0040,4037)	ALL	REMOVED		ALWAYS	
Performed Procedure Step Start DateTime	(0040,4050)	ALL	REMOVED		ALWAYS	
Procedure Step Cancellation DateTime	(0040,4052)	ALL	REMOVED		ALWAYS	
Verifying Observer Sequence	(0040,A073)	ALL	REMOVED		ALWAYS	

Attribute Name	Tag	SOP Class UID	Type of Change	New Value	Condition	Comments
Verifying Observer Name	(0040,A075)	ALL	MODIFIED	DeIdentified	OTHER	If the Attribute has a value
Author Observer Sequence	(0040,A078)	ALL	REMOVED		ALWAYS	
Participant Sequence	(0040,A07A)	ALL	REMOVED		ALWAYS	
Custodial Organization Sequence	(0040,A07C)	ALL	REMOVED		ALWAYS	
Verifying Observer Identification Code Sequence	(0040,A088)	ALL	REMOVED		ALWAYS	
Person Name	(0040,A123)	ALL	MODIFIED	DeIdentified	OTHER	If the Attribute has a value
Observation Date '(Trial)	(0040,A192)	ALL	REMOVED		ALWAYS	Retired
Observation Time '(Trial)	(0040,A193)	ALL	REMOVED		ALWAYS	Retired
Current Observer '(Trial)	(0040,A307)	ALL	REMOVED		ALWAYS	Retired
Verbal Source '(Trial)	(0040,A352)	ALL	REMOVE		ALWAYS	Retired
Address '(Trial)	(0040,A353)	ALL	REMOVED		ALWAYS	Retired
Telephone Number '(Trial)	(0040,A354)	ALL	REMOVED		ALWAYS	Retired
Verbal Source Identifier Code Sequence '(Trial)	(0040,A358)	ALL	REMOVED		ALWAYS	Retired
Graphic Annotation Sequence	(0070,0001)	ALL	REMOVED		ALWAYS	
Content Creator's Name	(0070,0084)	ALL	MODIFIED	Empty Value	OTHER	If the Attribute has a value
Icon Image Sequence	(0088,0200)	ALL	REMOVED		ALWAYS	
Topic Title	(0088,0904)	ALL	REMOVED		ALWAYS	Retired
Topic Subject	(0088,0906)	ALL	REMOVED		ALWAYS	Retired
Topic Author	(0088,0910)	ALL	REMOVED		ALWAYS	Retired
Topic Keywords	(0088,0912)	ALL	REMOVED		ALWAYS	Retired
Digital Signature UID	(0400,0100)	ALL	REMOVED		ALWAYS	
Referenced Digital Signature Sequence	(0400,0402)	ALL	REMOVED		ALWAYS	
Referenced SOP Instance MAC Sequence	(0400,0403)	ALL	REMOVED		ALWAYS	
MAC	(0400,0404)	ALL	REMOVED		ALWAYS	
Modified Attributes Sequence	(0400,0550)	ALL	REMOVED		ALWAYS	

Attribute Name	Tag	SOP Class UID	Type of Change	New Value	Condition	Comments
Original Attributes Sequence	(0400,0561)	ALL	REMOVED		ALWAYS	
Text String	(2030,0020)	ALL	REMOVED		ALWAYS	
Source Serial Number	(3008,0105)	ALL	REMOVED		ALWAYS	
Reviewer Name	(300E,0008)	ALL	MODIFIED	Empty Value	OTHER	If the Attribute has a value
Arbitrary	(4000,0010)	ALL	REMOVED		ALWAYS	Retired
Text Comments	(4000,4000)	ALL	REMOVED		ALWAYS	Retired
Results ID Issuer	(4008,0042)	ALL	REMOVED		ALWAYS	Retired
Interpretation Recorder	(4008,0102)	ALL	REMOVED		ALWAYS	Retired
Interpretation Transcriber	(4008,010A)	ALL	REMOVED		ALWAYS	Retired
Interpretation Text	(4008,010B)	ALL	REMOVED		ALWAYS	Retired
Interpretation Author	(4008,010C)	ALL	REMOVED		ALWAYS	Retired
Interpretation Approver Sequence	(4008,0111)	ALL	REMOVED		ALWAYS	Retired
Physician Approving Interpretation	(4008,0114)	ALL	REMOVED		ALWAYS	Retired
Interpretation Diagnosis Description	(4008,0115)	ALL	REMOVED		ALWAYS	Retired
Results Distribution List Sequence	(4008,0118)	ALL	REMOVED		ALWAYS	Retired
Distribution Name	(4008,0119)	ALL	REMOVED		ALWAYS	Retired
Distribution Address	(4008,011A)	ALL	REMOVED		ALWAYS	Retired
Interpretation ID Issuer	(4008,0202)	ALL	REMOVED		ALWAYS	Retired
Impressions	(4008,0300)	ALL	REMOVED		ALWAYS	Retired
Results Comments	(4008,4000)	ALL	REMOVED		ALWAYS	Retired
Digital Signatures Sequence	(FFFA,FFFA)	ALL	REMOVED		ALWAYS	
Data Set Trailing Padding	(FFFC,FFFC)	ALL	REMOVED		ALWAYS	
In addition all Private Data Attributes are removed.						

Table 5.2-14 Standard Header Correction Set *"Remove All Private Data Elements (Pattern Based)"* [1)]

Pattern	SOP Class UID	Type of Change	New Value	Condition	Comments
(0008,0080) Institution Name	ALL	REMOVED		ALWAYS	
(0008,0081) Institution Address	ALL	REMOVED		ALWAYS	
(0008,1010) Station Name	ALL	REMOVED		ALWAYS	
(0008,1040) Institutional Department Name	ALL	REMOVED		ALWAYS	
(0008,1070) Operators' Name	ALL	REMOVED		ALWAYS	
(0018,1000) Device Serial Number	ALL	REMOVED		ALWAYS	
(0018,A003) Contribution Description	ALL	REMOVED		ALWAYS	
(50**,****)	ALL	REMOVED		ALWAYS	
(60**,0100)	ALL	REMOVED		ALWAYS	
(60**,0102)	ALL	REMOVED		ALWAYS	
(60**,3000)	ALL	REMOVED		ALWAYS	
(60**,4000)	ALL	REMOVED		ALWAYS	
In addition, all Private Data Attributes are removed.					

[1)] The Actions requested by the Header Correction Rule Set is extended to the whole depth of the Data Set. This means, that the action is performed also in the Sequences not only in the top-level of the DICOM Data Set.

The character * stands for any single digit in the given position in the Tag Number. If no * is in the pattern, the entire Tag Number must be indicated. In this case only exact matches are considered.

5.2.6 Storage Commitment Service

5.2.6.1 SCU of the Storage Commitment Push Model SOP Class

As a Service Class User of the Storage Commitment SOP Class, syngo CT uses the N-ACTION-RQ message to request storage commitment from a remote SCP for all previously stored Instances. In turn, it receives N-EVENT-REPORT-RQ messages from the SCP indicating success or failure of the request.

As a Service Class User of the Storage Commitment Push Model SOP Class the product supports committing all Storage SOP Classes listed in Section 1.1 Content and Transfer.

The Storage Commitment Request will be sent out with a delay after the Storage Request, to ensure that the remote node properly indexes received Instances. The delay time is configurable with a default delay of 10 minutes.

The system may issue one N-ACTION-RQ for a complete set (bundle) of Instances or issue one N-ACTION-RQ per Instance. This behavior is configurable; the default value is "bundled".

syngo CT does not support the Storage Media File-Set ID and UID attributes.

syngo CT will accept the N-EVENT-REPORT-RQ on the same Association if sent immediately after the N-ACTION-RSP. However, it will not wait for it. The Association is closed after three seconds (this is a hard coded value). In this case a reverse SCP/SCU Role Selection Negotiation takes place. syngo CT will serve as an Association Acceptor for the confirmation sent by the Remote DICOM Node.

Table 5.2-15 lists the behavior of syngo CT for possible Failure Reason (0008,1197) in the Failed SOP Sequence (0008,1198) upon receiving an N-EVENT-REPORT request from the SCP with an Event Type ID of 2 (Storage Commitment Request Complete – Failures Exist).

Table 5.2-15 Failure Behavior for Storage Commitment SCU

Status Code	Description	Behavior
0110	Processing failure: A general failure in processing the operation was encountered.	Following processing is in place: • All the incoming Status Codes are logged. • All the incoming Status Codes can be traced. • Providing the Status Codes to the users
0122	No such object Instance: One or more of the elements in the Referenced SOP Instance Sequence was not available.	
0119	Class / Instance conflict: The SOP Class of an element in the Referenced SOP Instance Sequence did not correspond to the SOP Class registered for this SOP Instance at the SCP.	
0122	Referenced SOP Class not supported: Storage Commitment has been requested for a SOP Instance with a SOP Class that is not supported by the SCP	
0131	Duplicate transaction UID: The Transaction UID of the Storage Commitment Request is already in use.	
0213	Resource limitation: The SCP does not currently have enough resources to store the requested SOP Instance(s).	

In case syngo CT receives the report of a successful Storage Commitment Operation, the SOP Instances that were sent, are marked as archived. For archived SOP Instances an automatic deletion mechanism can be set up.

syngo CT has a configurable expiration timeout for the Transaction UID. By default, the timeout for the Transaction UID is 60 minutes. If the N-EVENT-REPORT does not arrive in this time interval, the archive operation is considered failed.

5.2.6.2 SCP of the Storage Commitment SOP Class

N/A

5.2.7 Query/Retrieve Service

5.2.7.1 SCU of the Study Root Q/R Information Model – FIND SOP Class

As a Service Class User of the Study Root Q/R Information Model - FIND SOP Class, syngo CT uses the C-FIND-RQ message and supports the Query Keys listed in Table 5.2-16 for hierarchical queries.

If the data received on the C-FIND-RQ does not specify a Specific Character Set (SCS), it is interpreted according to the default SCS. If the data received does specify an SCS in the header, it is interpreted accordingly.

In the "Matching Type" column the following values can be used:

- SINGLE_VALUE: SCU can request Single Value Matching on this Attribute.
- UID: SCU can request List of UID Matching on this Attribute.
- WILDCARD: SCU can request Wild Card Matching on this Attribute.

- RANGE: SCU can request Range Matching on this Attribute.
- SEQUENCE: SCU can request Sequence Matching on this Attribute.
- UNIVERSAL: SCU can request Attribute as a return value (Universal Matching).

In the "Query Value Source" column the following values can be used:

- FIXED: The query value cannot be modified by the user or by configuration.
- GENERATED: The query value is generated by the system (e.g. current date as the study date).
- CONFIGURATION: The query value is dependent on system configuration.
- USER: The query value is entered by the user.
- SCANNED: The query value is read from a barcode scanner or similar device.
- EMPTY: The query value is left empty to indicate it is a Return Key only.

In the "Display on UI" column the following values can be used:

- D: the return value is displayed on the main UI by default.
- C: the return value is displayed on the main UI if configured.
- N: the return value is never displayed.

Table 5.2-16 Supported C-FIND Attribute Matching for Study Root Information Q/R Model - SCU

Attribute Name	Tag	Matching Type	Query Value Source	Value	Display on UI	Comments
Patient Level						
Patient's Name	(0010,0010)	WILDCARD	USER		D	An * is always added to the end of the search string.
Patient ID	(0010,0020)	WILDCARD	USER		D	An * is always added to the end of the search string.
Issuer of Patient ID	(0010,0021)	WILDCARD	USER		D	An * is always added to the end of the search string.
Patient's Birth Date	(0010,0030)	SINGLE_VALUE; RANGE	USER		D	The User can enter on the GUI a starting date and an ending date for this value. If only the starting date is available, a UNIVERSAL search is executed.
Patient's Birth Time	(0010,0032)	SINGLE_VALUE; RANGE	USER		D	The User can enter on the GUI a starting time and an ending time for this value. If only the starting time is available, a UNIVERSAL search is executed.

Attribute Name	Tag	Matching Type	Query Value Source	Value	Display on UI	Comments
						Only used together with the Patient's Birth Date.
Patient's Sex	(0010,0040)	SINGLE_VALUE	USER		D	
Number of Patient Related Studies	(0020,1200)	UNIVERSAL	EMPTY		N	
Number of Patient Related Series	(0020,1202)	UNIVERSAL	EMPTY		N	
Number of Patient Related Instances	(0020,1204)	UNIVERSAL	EMPTY		N	
Study Level						
Accession Number	(0008,0050)	WILDCARD	USER		D	An * is always added to the end of the search string.
Study ID	(0020,0010)	WILDCARD	USER		D	An * is always added to the end of the search string.
Study Instance UID	(0020,000D)	UID, UNIVERSAL	USER		D	
Study Date	(0008,0020)	RANGE,;SINGLE_VALUE	USER		D	The User can enter on the GUI a starting date and an ending date for this value. If only the starting date is available, a SINGLE_VALUE search is executed.
Study Time	(0008,0030)	RANGE; SINGLE_VALUE	USER		D	The User can enter on the GUI a starting time and an ending time for this value. If only the starting time is available, a SINGLE_VALUE search is executed. Only used together with the Study Date.
Referring Physician' s Name	(0008,0090)	WILDCARD	USER		D	An * is always added to the end of the search string.

Attribute Name	Tag	Matching Type	Query Value Source	Value	Display on UI	Comments
Study Description	(0008,1030)	WILDCARD	USER		D	An * is always added to the end of the search string.
Number of Study related Instances	(0020,1208)	UNIVERSAL	EMPTY		N	
Modalities in Study	(0008,0061)	RANGE	USER		D	The User can choose several Modalities from a multiple choice list on the GUI.
Number of Study Related Series	(0020,1206)	UNIVERSAL	EMPTY		N	
Series Level						
Modality	(0008,0060)	SINGLE_VALUE	USER		C	The User can choose several Modalities from a multiple choice list on the GUI.
Series Date	(0008,0021)	RANGE; SINGLE_VALUE	USER		C	The User can enter on the GUI a starting date and an ending date for this value. If only the starting date is available, a SINGLE_VALUE search is executed.
Series Time	(0008,0031)	RANGE; SINGLE_VALUE	USER		C	The User can enter on the GUI a starting time and an ending time for this value. If only the starting time is available, a SINGLE_VALUE search is executed. Only used together with the Series Date.
Series Number	(0020,0011)	SINGLE_VALUE	USER		C	
Series Description	(0008,103E)	WILDCARD	USER		C	An * is always added to the end of the search string.

Attribute Name	Tag	Matching Type	Query Value Source	Value	Display on UI	Comments
Request Attributes Sequence	(0040,0275)	WILDCARD	USER		C	An * is always added to the end of the search string.
> Requested Procedure ID	(0040,1001)	WILDCARD	USER		C	An * is always added to the end of the search string.
> Scheduled Procedure Step ID	(0040,0009)	WILDCARD	USER		C	An * is always added to the end of the search string.
Performed Procedure Step Start Date	(0040,0244)	RANGE; SINGLE_VALUE	USER		C	The User can enter on the GUI a starting date and an ending date for this value. If only the starting date is available, a SINGLE_VALUE search is executed.
Performed Procedure Step Start Time	(0040,0245)	RANGE; SINGLE_VALUE	USER		C	The User can enter on the GUI a starting time and an ending time for this value. If only the starting time is available, a SINGLE_VALUE search is executed. Only used together with the Performed Procedure Step Date.
Series Instance UID	(0020,000E)	UNIVERSAL	EMPTY	1.3.12.2.1107.5.1.7. + *serial number + part created per Series Instance*		

The user can cancel any running Query. In this case C-CANCEL-FIND-RQ is sent to the SCP. The processing of the data received in the respective Association is stopped and the Association is closed if C-FIND-RSP is received with the Status Cancel. If the confirmation for C-CANCEL-FIND-RQ does not arrive during the Transfer Inactivity Timeout (see Table 6.1-1) the Association will be closed.

In case of querying SOP Instances with non-default character sets, the Patient Name is matched as wild card by always adding an * at the end. The user can enter any permitted character or ideogram in the search field.

If a Person Name attribute contains multiple representations, the GUI will display all representations.

5.2.7.2 SCU of the Patient Root Q/R Information Model – FIND SOP Class

N/A

5.2.7.3 SCU of the Patient/Study Only Q/R Information Model – FIND SOP Class

N/A

5.2.7.4 SCU of the Study Root Q/R Information Model – MOVE SOP Class

syngo CT allows the retrieval multiple entries. Retrieval is possible on Study or Series level. Retrieving on Image Level is not supported. This means, that for a selected Study or Series, every Instance will be retrieved.

The user can cancel any ongoing Retrieve. In this case C-CANCEL-MOVE-RQ is sent to the SCP. The processing of the data received in the respective Association is stopped and the Association is closed if C-FIND-RSP is received with the Status Cancel. If the confirmation for C-CANCEL-MOVE-RQ does not arrive during the Transfer Inactivity Timeout (see Table 6.1-1) the Association will be closed.

Sending matching Instances to a different AE Title is possible, if requested in the C-MOVE-RQ (Move Destination AE).

If C-MOVE-RQ is sent, but no C-STORE-RQ arrives during the configurable Retrieve Transfer Activity Timeout, the Association is closed, and the job fails. The default timeout value is 20 Minutes.

If the data arrived on the C-MOVE-RQ does contain a reference to a Specific Character Set, syngo CT will handle the binary data accordingly. Is the SCS Information missing in the incoming DICOM message, syngo CT will handle the binary data based the default SCS.

List of UID Matching is not supported.

5.2.7.5 SCU of the Patient Root Q/R Information Model – MOVE SOP Class

N/A

5.2.7.6 SCU of the Patient/Study Only Q/R Information Model – MOVE SOP Class

N/A

5.2.7.7 SCP of the Study Root Q/R Information Model – FIND SOP Class

As a Service Class Provider of the Study Root Q/R Information Model - FIND SOP Class, syngo CT uses the C-FIND-RSP to communicate matches back to the SCU. It supports the Key Attributes listed in Table 5.2-17 for hierarchical queries. As a response to an incoming C-FIND-RQ the data is sent with the SCS specified in the Data Set of the SOP Instance.

In the "Matching Type" column, the following values can be used:

- SINGLE_VALUE: SCP can perform Single Value Matching on this Attribute.
- UID: SCP can perform List of UID Matching on this Attribute.
- WILDCARD: SCP can perform Wild Card matching on this Attribute.
- RANGE: SCP can perform Range Matching on this Attribute.
- SEQUENCE: SCP can perform Sequence Matching on this Attribute.
- UNIVERSAL: SCP can provide the Attribute in the C-FIND response (Universal Matching).

Table 5.2-17 Supported C-FIND Attribute Matching for Study Root Q/R Information Model – SCP

Attribute Name	Tag	Matching Type	Comments
Patient Level			
Patient's Name	(0010,0010)	WILDCARD	
Patient ID	(0010,0020)	WILDCARD	
Issuer of Patient ID	(0010,0021)	WILDCARD	
Patient's Birth Date	(0010,0030)	SINGLE_VALUE, RANGE	
Patient's Birth Time	(0010,0032)	SINGLE_VALUE, RANGE	
Patient's Sex	(0010,0040)	SINGLE_VALUE	
Number of Patient Related Studies	(0020,1200)	UNIVERSAL	
Number of Patient Related Series	(0020,1202)	UNIVERSAL	
Number of Patient Related Instances	(0020,1204)	UNIVERSAL	
Study Level			
Accession Number	(0008,0050)	WILDCARD	
Study ID	(0020,0010)	WILDCARD	
Study Instance UID	(0020,000D)	SINGLE_VALUE	
Study Date	(0008,0020)	RANGE, SINGLE_VALUE	
Study Time	(0008,0030)	RANGE, SINGLE_VALUE	
Referring Physician' s Name	(0008,0090)	WILDCARD	
Study Description	(0008,1030)	WILDCARD	
Modalities in Study	(0008,0061)	SINGLE_VALUE	
Series Level			
Modality	(0008,0060)	SINGLE_VALUE	
Series Date	(0008,0021)	RANGE, SINGLE_VALUE	
Series Time	(0008,0031)	RANGE, SINGLE_VALUE	
Series Number	(0020,0011)	SINGLE_VALUE	
Series Description	(0008,103E)	WILDCARD	
Request Attributes Sequence	(0040,0275)	WILDCARD	
> Requested Procedure ID	(0040,1001)	WILDCARD	
> Scheduled Procedure Step ID	(0040,0009)	WILDCARD	
Performed Procedure Step Start Date	(0040,0244)	RANGE, SINGLE_VALUE	
Performed Procedure Step Start Time	(0040,0245)	RANGE, SINGLE_VALUE	
Series Instance UID	(0020,000E)	SINGLE_VALUE	
Instance Level			
Instance Number	(0020,0013)	WILDCARD	
SOP Instance UID	(0008,0018)	UID	
SOP Class UID	(0008,0016)	UID	

If a C-CANCEL-FIND-RQ is received, the processing of the Query is stopped, and a Confirmation is sent (in form of a C-FIND-RSP with the Status Cancel). After sending the Confirmation, the Association is closed.

5.2.7.8 SCP of the Patient Root Q/R Information Model – FIND SOP Class

As a Service Class Provider of the Patient Root Q/R Information Model - FIND SOP Class, syngo CT uses the C-FIND-RSP to communicate matches back to the SCU. It supports the Key Attributes listed in Table 5.2-17 for hierarchical queries.

syngo CT supports the same Key Attributes for the Patient Root Q/R Information Model - FIND SOP Class as for the Study Root Q/R Information Model - FIND SOP Class (see Table 5.2-17).

If a C-CANCEL-FIND-RQ is received, the processing of the Query is stopped, and a Confirmation is sent (in form of a C-FIND-RSP with the Status Cancel). After sending the Confirmation, the Association is closed.

5.2.7.9 SCP of the Patient/Study Only Q/R Information Model - FIND SOP Class

As a Service Class Provider of the retired Patient/Study Only Q/R Information Model - FIND SOP Class, syngo CT uses the C-FIND-RSP to communicate matches back to the SCU. It supports the Matching Keys listed in Table 5.2-17 for hierarchical queries.

syngo CT supports the same Key Attributes for the Patient/Study Only Q/R Information Model - FIND SOP Class as for the Study Root Q/R Information Model - FIND SOP Class (see Table 5.2-17).

If a C-CANCEL-FIND-RQ is received, the processing of the Query is stopped, and a Confirmation is sent (in form of a C-FIND-RSP with the Status Cancel). After sending the Confirmation, the Association is closed.

5.2.7.10 SCP of the Study Root Q/R Information Model – MOVE SOP Class

As the SCP of the Study Root Q/R Information Model – MOVE, syngo CT receives the C-MOVE-RQ and in turn uses the C-STORE-RQ sub-operation to send matching SOP Instances to the Move Destination AE included in the C-MOVE-RQ.

If a C-CANCEL-MOVE-RQ is received, the processing is stopped, and a Confirmation is sent (in form of a C-MOVE-RSP with the Status Cancel). After sending the Confirmation, the Association is closed.

5.2.7.11 SCP of the Patient Root Q/R Information Model – MOVE SOP Class

As the SCP of the Patient Root Q/R Information Model –MOVE, syngo CT receives the C-MOVE-RQ and in turn uses the C-STORE-RQ sub operation to send matching SOP Instances to the Move Destination AE included in the C-MOVE-RQ.

If a C-CANCEL-MOVE-RQ is received, the processing is stopped, and a Confirmation is sent (in form of a C-MOVE-RSP with the Status Cancel). After sending the Confirmation, the Association is closed.

5.2.7.12 SCP of the Patient/Study Only Q/R Information Model – MOVE SOP Class

As the SCP of the retired Patient/Study Root Only Q/R Information Model –MOVE, syngo CT receives the C-MOVE-RQ and in turn uses the C-STORE-RQ sub operation to send matching SOP Instances to the Move Destination AE included in the C-MOVE-RQ.

If a C-CANCEL-MOVE-RQ is received, the processing is stopped, and a Confirmation is sent (in form of a C-MOVE-RSP with the Status Cancel). After sending the Confirmation, the Association is closed.

5.2.8 Print Management Service

Please note, that syngo CT does support printing DICOM images to usual printers (not only DICOM printers) on plain paper. In this case the printing feature of the Operating System will be used instead of a DICOM Protocol based printing.

5.2.8.1 SCU of the Basic Grayscale Print Management Meta SOP Class

The Basic Grayscale Print Management Meta SOP Class is composed of the mandatory SOP Classes listed in Table 5.2-18.

Table 5.2-18 Basic Grayscale Print Management Meta SOP Class - SCU

SOP Class Name	SOP Class UID
Basic Film Session SOP Class	1.2.840.10008.5.1.1.1
Basic Film Box SOP Class	1.2.840.10008.5.1.1.2
Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4
Printer SOP Class	1.2.840.10008.5.1.1.16

5.2.8.1.1 Basic Film Session SOP Class

The Basic Film Session describes all the user-defined parameters, which are common for all the films of a film session. The Basic Film Session refers to one or more Basic Film Boxes that are printed on one hardcopy printer.

Table 5.2-19 lists the supported DIMSE Services for the Basic Film Session SOP Class:

Table 5.2-19 Services for the Basic Film Session SOP Class - SCU

DIMSE Service Element	Purpose
N-CREATE	Create the film session
N-DELETE	Delete the film session

Table 5.2-20 lists the supported N-CREATE Attributes for Basic Film Session:

Table 5.2-20 Supported N-CREATE Attributes for the Basic Film Session SOP Class - SCU

Attribute Name	Tag	Values	Default
Number of Copies	(2000,0010)	1	
Medium Type	(2000,0030)	BLUE FILM; CLEAR FILM; MAMMO BLUE FILM; MAMMO CLEAR FILM; PAPER	

The Affected SOP Instance UID received with N-CREATE-RSP message will be kept internally and used for later requests (e.g. N-DELETE-RQ) on the Basic Film Session.

The N-DELETE-RQ on the Basic Film Session SOP Class is used to remove the complete Basic Film Session SOP Instance hierarchy.

Table 5.2-21 lists the supported N-DELETE Attributes for Basic Film Session:

Table 5.2-21 Supported N-DELETE Attributes for the Basic Film Session SOP Class - SCU

Attribute Name	Tag	Values	Default
Message ID	(0000,0110)		
Requested SOP Class UID	(0000,1001)	1.2.840.10008.5.1.1.1	
Requested SOP Instance UID	(0000,1001)		

5.2.8.1.2 Basic Film Box SOP Class

The Basic Film Box describes all user-defined parameters of one film of the film session including presentation parameters, which are common for all images on a given film sheet.

The Basic Film Box refers to one or more Image Boxes.

Table 5.2-22 lists the supported DIMSE Services for the Basic Film Box SOP Class:

Table 5.2-22 Supported Services for the Basic Film Box SOP Classes

DIMSE Service Element	Purpose
N-CREATE	Create the film Box in a previously created film session
N-ACTION	Print the Film Box
N-DELETE	Delete the Film Box

Table 5.2-23 lists the supported N-CREATE Attributes for Basic Film Box. The actual values for each attribute depend on DICOM printer configuration within syngo CT DICOM Print Management SCU:

Table 5.2-23 Supported N-CREATE Attributes for the Basic Film Box SOP Class - SCU

Attribute Name	Tag	Values	Default
Image Display Format	(2010,0010)	STANDARD\1,1	
Film Orientation	(2010,0040)	PORTRAIT; LANDSCAPE	
Film Size ID	(2010,0050)	8INX10IN; 10INX12IN; 10INX14IN; 11INX14IN; 14INX14IN; 14INX17IN; 24CMX24CM; 24CMX30CM	
Magnification Type	(2010,0060)	REPLICATE; BILINEAR; CUBIC; NONE	
Border Density	(2010,0100)	BLACK; WHITE	
Minimum Density	(2010,0120)	0 < value	
Maximum Density	(2010,0130)	0..50	
Illumination [1)]	(2010,015E)	0 < value	
Reflective Ambient Light [1)]	(2010,0160)	0 < value	
Referenced Film Session Sequence	(2010,0500)	<possible values or range>	
>Referenced SOP Class UID	(0008,1150)	1.2.840.10008.5.1.1.1	
>Referenced SOP Instance UID	(0008,1155)		
Referenced Presentation LUT Sequence [1)]	(2050,0500)		
>Referenced SOP Class UID	(0008,1150)	1.2.840.10008.5.1.1.23	
>Referenced SOP Instance UID	(0008,1155)		

[1)] Required if Presentation LUT is present

The N-CREATE-RSP message from the Print SCP includes the Referenced Image Box Sequence with SOP Class/Instance UID pairs which will be kept internally to be further used for the subsequent Basic Image Box SOP Class N-SET-RQ messages.

When all Image Boxes (including parameters) for the film-sheet have been set, syngo CT print manager will issue an N-ACTION-RQ message with the SOP Instance UID of the Basic Film Box and the Action Type ID of 1.

The affected SOP Instance UID received with N-CREATE-RSP message will be kept internally and used for later requests (e.g., N-DELETE-RQ) on the Basic Film Box.

Table 5.2-24 Supported N-ACTION Attributes for the Basic Film Session SOP Class - SCU

Attribute Name	Tag	Value	Default
Message ID	(0000,0110)		
Requested SOP Class UID	(0000,1001)	1.2.840.10008.5.1.1.2	
Requested SOP Instance UID	(0000,1001)		
Action Type ID	(0000,1008)	1 (Print)	

Table 5.2-25 lists the supported N-DELETE Attributes for Basic Film Box Class:

Table 5.2-25 Supported N-DELETE Attributes for the Basic Film Session SOP Class - SCU

Attribute Name	Tag	Value	Default
Message ID	(0000,0110)		
Requested SOP Class UID	(0000,1001)	1.2.840.10008.5.1.1.2	
Requested SOP Instance UID	(0000,1001)		

5.2.8.1.3 Basic Grayscale Image Box SOP Class

The Basic Grayscale Image Box is the presentation of an image and image related data in the image area of a film. The Basic Image Box describes the presentation parameters and image pixel data, which apply to a single image of a sheet of film.

Table 5.2-26 lists the supported DIMSE Service for the Basic Grayscale Image Box SOP Class:

Table 5.2-26 Services for the Basic Grayscale Image Box SOP Class

DIMSE Service Element	Purpose
N-SET	Set Image Attributes for a previously created film box

Table 5.2-27 lists the supported N-SET Attributes for Basic Grayscale Image Box:

Table 5.2-27 Supported N-SET Attributes for the Basic Grayscale Image Box SOP Class - SCU

Attribute Name	Tag	Values	Default
Image Box Position	(2020,0010)	1	
Basic Grayscale Image Sequence	(2020,0110)		
>Samples per Pixel	(0028,0002)	1	
>Photometric Interpretation	(0028,0004)	MONOCHROME2	
>Rows	(0028,0010)		
>Columns	(0028,0011)		
>Pixel Aspect Ratio	(0028,0034)		
>Bits Allocated	(0028,0100)	8 16	
>Bits Stored	(0028,0101)	8 12	

Attribute Name	Tag	Values	Default
>High Bit	(0028,0102)	7 11	
>Pixel Representation	(0028,0103)	0	0
>Pixel Data	(7FE0,0010)		

5.2.8.1.4 Printer SOP Class

Table 5.2-28 lists the supported DIMSE Services for the Printer SOP Class:

Table 5.2-28 Services for the Printer SOP Class

DIMSE Service Element	Purpose
N-EVENT-REPORT	Report the printer status in an asynchronous way
N-GET	Explicit request to find out the printer status.

Before the N-CREATE messages are sent to set up the Basic Film Session, an N-GET message is sent to the DICOM Printer to request its status.

An N-EVENT-REPORT request can be received by the SCU at any time during an Association using reverse SCP/SCU Role Selection Negotiation.

All incoming N-EVENT-REPORT-RQ are handled and analyzed, during the Printing process. Every Printer Status notification is forwarded to the user via the DICOM Print Service if the Status has changed since the last notification.

Table 5.2-29 summarizes the behavior of the SCU when receiving Event Types within the N-EVENT-REPORT.

Table 5.2-29 Printer SOP Class N-EVENT-REPORT Behavior

Event Type Name	Event Type ID	Behavior
Normal	1	
Warning	2	
Failure	3	If a Print job is running, it will be cancelled.

Table 5.2-30 Supported N-GET Attributes for the Printer SOP Class - SCU lists the supported N-GET Attributes for Printer SOP Class:

Table 5.2-30 Supported N-GET Attributes for the Printer SOP Class - SCU

Attribute Name	Tag	Behavior
Printer Status	(2110,0010)	NORMAL; WARNING; FAILURE
Printer Status Info	(2110,0020)	See the documentation of the printer for possible values.

5.2.8.2 SCU of the Basic Color Print Management Meta SOP Class

The Basic Color Print Management Meta SOP Class is composed of the mandatory SOP Classes listed in Table 5.2-31:

Table 5.2-31 Basic Color Print Management Meta SOP Class

SOP Class Name	SOP Class UID
Basic Film Session SOP Class	1.2.840.10008.5.1.1.1

SOP Class Name	SOP Class UID
Basic Film Box SOP Class	1.2.840.10008.5.1.1.2
Basic Color Image Box SOP Class	1.2.840.10008.5.1.1.4.1
Printer SOP Class	1.2.840.10008.5.1.1.16

5.2.8.2.1 Basic Film Session SOP Class

The parameters for the Basic Film Session SOP Class of the Basic Color Print Management Meta SOP Class are the same as described for the Basic Grayscale Print Management Meta SOP Class in Section 5.2.8.1.1.

5.2.8.2.2 Basic Film Box SOP Class

The parameters for the Basic Film Box SOP Class of the Basic Color Print Management Meta SOP Class are the same as described for the Basic Grayscale Print Management Meta SOP Class in Section 5.2.8.1.2.

5.2.8.2.3 Basic Color Image Box SOP Class

Table 5.2-32 lists the supported DIMSE Service for the Basic Color Image Box SOP Class:

Table 5.2-32 Services for the Basic Color Image Box SOP Class - SCU

DIMSE Service Element	Purpose
N-SET	Set each Image Attributes for a previously created film box

Table 5.2-33 lists the supported N-SET Attributes for Basic Color Image Box:

Table 5.2-33 Supported N-SET Attributes for the Basic Color Image Box SOP Class - SCU

Attribute Name	Tag	Values	Default
Image Box Position	(2020,0010)		
Basic Color Image Sequence	(2020,0111)		
>Samples per Pixel	(0028,0002)	3	
>Photometric Interpretation	(0028,0004)	RGB	
>Planar Configuration	(0028,0006)	0	
>Rows	(0028,0010)		
>Columns	(0028,0011)		
>Pixel Aspect Ratio	(0028,0034)		
>Bits Allocated	(0028,0100)	8	
>Bits Stored	(0028,0101)	8	
>High Bit	(0028,0102)	7	
>Pixel Representation	(0028,0103)	0	
>Pixel Data	(7FE0,0010)		

5.2.8.2.4 Printer SOP Class

The parameters for the Printer SOP Class of the Basic Color Print Management Meta SOP Class are the same as described for the Basic Grayscale Print Management Meta SOP Class in Section 5.2.8.1.4.

5.2.8.3 SCU of the Basic Annotation Box SOP Class

N/A

5.2.8.4 SCU of the Print Job SOP Class

Every incoming N-EVENT-REPORT-RQ message is processed and analyzed if a printing is in progress. Is a print job already running and the DIMSE Status received does point to a Failure or a Warning, a Job Status Notification is issued to the user (via the DICOM Print Service). Additionally, the job gets cancelled.

Table 5.2-34 lists the supported DIMSE Services for the Print Job SOP Class:

Table 5.2-34 Services for the Print Job SOP Class - SCU

DIMSE Service Element	Purpose
N-EVENT-REPORT	Report the printer status in an asynchronous way

An N-EVENT-REPORT request can be received by the SCU at any time during an Association if the Print Job SOP Class has been negotiated by the SCU.

Table 5.2-35 summarizes the behavior of the SCU when receiving Event Types within the N-EVENT-REPORT.

Table 5.2-35 Print Job SOP Class N-EVENT-REPORT Behavior

Event Type Name	Event Type ID	Behavior
Pending	1	No action taken
Printing	2	No action taken
Done	3	No action taken
Failure	4	The failure code is reported to the user and the Print Job itself is cancelled.

5.2.8.5 SCU of the Presentation LUT SOP Class

Table 5.2-36 lists the supported DIMSE Services for the Presentation LUT SOP Class:

Table 5.2-36 Services for the Presentation LUT SOP Class - SCU

DIMSE Service Element	Purpose
N-CREATE	Create the Presentation LUT Instance
N-DELETE	Delete the Presentation LUT Instance

Table 5.2-37 lists the supported N-CREATE Attributes for Presentation LUT:

Table 5.2-37 Supported N-CREATE Attributes for the Presentation LUT SOP Class - SCU

Attribute Name	Tag	Values	Default
Presentation LUT Shape	(2050,0020)	IDENTITY	

The affected SOP Instance UID received with N-CREATE-RSP message will be kept internally and is used for later requests on the Basic Film Box (N-CREATE-RQ) and on the Presentation LUT (N-DELETE-RQ).

5.2.8.6 SCU of the Printer Configuration Retrieval SOP Class

N/A

5.2.8.7 SCP of the Basic Grayscale Print Management Meta SOP Class

N/A

5.2.8.8 SCP of the Basic Color Print Management Meta SOP Class

N/A

5.2.8.9 SCP of the Basic Annotation Box SOP Class

N/A

5.2.8.10 SCP of the Print Job SOP Class

N/A

5.2.8.11 SCP of the Presentation LUT SOP Class

N/A

5.2.8.12 SCP of the Printer Configuration Retrieval SOP Class

N/A

5.3 Supported DICOM Web Services

N/A

5.4 Media Service

5.4.1 File-set Creator (FSC)

syngo CT supports creating the Basic Directory IOD as a File Set Creator as defined in Annex A.2.

On the GUI of syngo CT any kind of process, which writes DICOM Data to a data storage, that is not its internal database is called Export.

DICOM Data can be exported to:

- Optical Disc
- File System

syngo CT uses custom defined profiles for burning Optical Disks. On the GUI the user can only select those Profiles, which were previously defined and configured.

Each Media Burning Profile does have a unique name. Each Media Burning Profile can be configured to:

- Use or not to use compression;
- Create or not to create a DICOM File System;
- Include or not to include a DICOM Viewer on the Disc;
- Use or not to use Image Conversion (only applies for MR images);
- Use or not to use Data Minimization. If Data Minimization is used, one must provide by configuring the Media Burning Profile, to which extend the Data Minimization should occur (Full, Reduced, Service) and what string should be used as substitution for sensitive data (see Chapter 8.8 for further details).

syngo CT does not provide any distinction whatsoever between the type of the Optical Disc used. As a result, CDs, DVDs and Blu-ray disks are handled alike. The compression algorithm cannot be explicitly selected for the Media Burning Profile, since it is selected based on configuration (see Table 6.4-1 Media Storage Service Parameters for further details).

In the same way syngo CT does handle any kind of Export to File System alike. The destination can be a local hard disk, a pen drive or any USB connected data storage.

In case of an Export to File System, the user can directly configure the different options to request syngo CT to:

- Use or not to use compression;
- Create or not to create a DICOM File System;
- Include or not to include a DICOM Viewer on the Disc;
- Use or not to use Image Conversion (only applies for MR images);
- Use or not to use Data Minimization. If Data Minimization is used, one must provide by configuring the Media Burning Profile, to which extend the Data Minimization should occur (Full, Reduced, Service) and what string should be used as substitution for sensitive data (see Chapter 8.8 for further details).

Only the general augmented profile is supported.

For a list of supported Media Storage Application Profiles, see Section 1.4 in the Overview.

For a list of supported SOP Classes, see Section 1.1 in the Overview.

5.4.1.1 Media Storage Application Profile Selection Mechanism

The compression algorithm is selected from a user definable prioritized list of three algorithms. The list can be edited on the Administration Portal. The highest priority algorithm, that fits the data to be compressed will be applied.

For data export to optical drives the options above are combined in Media Burning Profiles, which are configurable on the Configuration Panel. Only one Media Burning Profile can be selected for an export operation to an optical drive.

The selection of the applicable Media Profile is based on the options described above, as described in Table 5.4-1.

Table 5.4-1 Media Profile Selection

Destination	Compression algorithm applied [1)]	DICOMDIR included	Image Conversion applied	Data Minimization	Selected Media Profile
General Purpose USB media	(as configured by the user)	Y	(as configured by the user)	(as configured by the user)	AUG-GEN-USB
General Purpose BluRay media	(as configured by the user)	Y	(as configured by the user)	(as configured by the user)	AUG-GEN-BD
General Purpose DVD media	(as configured by the user)	Y	(as configured by the user)	(as configured by the user)	AUG-GEN-DVD
General Purpose CD media	(as configured by the user)	Y	(as configured by the user)	(as configured by the user)	AUG-GEN-CD

[1)] The exact Transfer Syntax applied in this case is decided by the Configuration (see Default Media Compression in Table 6.4-1 Media Storage Service Parameters).

5.4.2 File-set Reader (FSR)

syngo CT supports the Media Storage Application Profiles listed in Section 1.4 in the Overview.

For a list of supported SOP Classes, see Section 1.1 in the Overview.

To see, for which SOP Instances Display and what kind of Processing are supported, please see Table 5.2-6.

5.4.3 File-set Updater (FSU)

N/A

5.5 Real Time Video Service

N/A

5.6 Cross Service Considerations

This Section describes interactions between the implementation of different DICOM Services in this product. Details internal to an individual service are addressed in previous Service Sections.

Note: The DICOM Standard typically does not define cross-service requirements. Therefore this Section provides implementation descriptions and not strictly DICOM Conformance.

5.6.1 PACS initiated Archiving

syngo CT provides an additional archiving possibility, which is based on a retrieve request from a remote AE, which is registered as a PACS.

Following the Retrieve Request of the PACS machine, a Network Transfer, in form of an Archiving Request (C-STORE) will be initiated by syngo CT.

5.6.2 Archiving with Derived Objects

If a destination is system is not able to store certain types of DICOM Data, syngo CT encodes the payload of that object in an Attribute or private Attribute of an IOD accepted by the receiving system. This mechanism is called encapsulation.

In case encapsulated DICOM Data is received from a remote system, syngo CT de-encapsulates it.

For example, if a PACS, which is used as target for a Storage Commitment Request, a PDF-object will be encapsulated as binary data in an Encapsulated PDF IOD.

The Encapsulation is described in the configuration parameters, in Table 6.2-3 Storage Service Parameters.

5.6.3 Autorouting

syngo CT provides a possibility to configure Autorouting rules.

An Autorouting rule allows to automatically relay (forward) DICOM Instances to one or more Remote DICOM Nodes. The decision of forwarding can be based on the AET of the sender node or the value of certain Attributes in the DICOM Instance.

Such a rule can be applied immediately or during the default archiving (or sending) process.

The applicability can be further restricted to imported media objects, received, and retrieved objects or saved and sent objects.

The configuration can be done on the Administration Portal.

5.6.4 Correction and re-arrangement

The user has the possibility to perform corrections on the DICOM Data stored in the System. If after such an operation the data leaves the system (via Export or Send) the corrections are applied.

5.7 Specific Character Sets

For Specific Character Sets in addition to the Default Character Repertoire, refer to Section 1.7 for the list of the Specific Character Set (0008,0005).

syngo CT can receive data encoded in the Specific Character Sets listed in Section 1.7. To handle such data correctly in syngo CT, one must set for syngo CT to work with the respective Specific Character Set. Since the underlying Operating System is delivered with syngo CT, the user can be sure, that it also does support the selected Specific Character Set.

When creating new Instances, the system will use the default SCS (or SCS List) configured on the machine.

When there is a mismatch between the given character set in Attribute (0008,0005) and the characters in the DICOM Data received by the system, then the following measures are taken to make the characters DICOM conform:

- Convert each illegal character to '?'

There are three categories of character sets which must be differentiated because of their different encoding formats:

- Conventional ISO character sets: default, ISO 2022 IR 6, ISO_IR 100, etc. → encoded as specified in ISO 2022
- ISO_IR 192 → encoded in UTF-8
- GB18030 → encoded in GB18030.

It is not possible to recognize the following mismatches automatically on receiving or importing:

- An attribute value is encoded in ISO_IR 192 ←→ (0008,0005) contains character set listed in Section 1.7 as primary character set.
- An attribute value is encoded in GB18030 ←→ (0008,0005) contains character set listed in Section 1.7 as primary character set.
- An attribute value is encoded in ISO 2022 ←→ (0008,0005) contains ISO_IR 192.
- An attribute value is encoded in ISO 2022 ←→ (0008,0005) contains GB18030.

An IOD that contains one of the above-mentioned inconsistencies is not DICOM conform. As these kinds of inconsistencies cannot be recognized by the system, the IOD will not be rejected but the character data might be corrupted.

syngo CT supports Kanji characters in the byte zones after 74 (79, 7A, 7B and 7C).

syngo CT does not support Conversion or Mapping to Non-Default Specific Character Sets.

6 Configuration

Throughout all subsections the following values can be used in the “Configurable” column:

- USER: The parameter is configurable by the user.
- SERVICE: The parameter is configurable by service personnel.
- FIXED: The parameter is not configurable (it has a fixed value). The value is required for the configuration of the remote system.
- N/A: The parameter is not applicable for the local or the remote system.

syngo CT does not limit the number of the configurable Remote Nodes. This applies to all the DIMSE Services. The communication capability is only limited by the Operating System.

Please note, that having lots of Remote Nodes (2000 or more) can affect the loading speed of the different GUIs.

Every Configuration where IP-Addresses are implied, IPv4 or IPv6 can be used.

6.1 General Configuration Parameters

Table 6.1-1 lists general configuration parameters applicable across all supported DICOM Services.

Table 6.1-1 General Configuration Parameters

Parameter	Configurable	Default Value	Comments
General Parameters			
Timeout waiting for acceptance or rejection Response to an Association Open Request. (Association Negotiation Timeout, Application-Level)	USER	30 seconds	Value range: 1 – 120 seconds
Timeout waiting for a response to an Association release request (Transfer Inactivity Timeout, Application-Level)	USER	30 seconds	Value range: 1 – 120 seconds The value of the timeout waiting for acceptance or rejection Response to an Association Open Request will be used.
General DIMSE level timeout values	USER	30 Seconds	Value range 1 – 300 seconds
TCP/IP Settings			
TCP/IP Send Buffer	FIXED	65535 Bytes	
TCP/IP Receive Buffer	FIXED	65535 Bytes	
TCP/IP Socket Timeout	USER	5 seconds	Value range: 1 – 60 Seconds.
Maximum PDU size	USER	32 KB	Value range: 16 – 512 KB
DICOM Services Parameters			
Maximum number of simultaneous Associations accepted	SERVICE		Please find the data in the respective Chapters describing the Service.
Specific Character Set	USER	ISO_IR 100	

6.2 Configuration of DIMSE Services

The tables in the following subsections show the configuration parameters required for DIMSE Services.

To identify whether syngo CT is an Association Acceptor and / or an Association Initiator, the following applies:

- Association Acceptor: The (Secured) Local Called AET and Remote Calling AET parameters are present.

- Association Initiator: The (Secured) Local Calling AET and Remote Called AET parameters are present.

6.2.1 Basic Worklist Management Service Configuration

Table 6.2-1 lists Worklist Service configuration parameters:

Table 6.2-1 Worklist Service Parameters

Local Configuration Parameters – Worklist			
Parameter	**Configurable**	**Default Value**	**Comments**
Calling AE Title (Association Initiator)	SERVICE	The machine name	
Only allow encrypted DICOM communication for incoming connections	SERVICE	(not set)	
Logical Name	SERVICE		
Location	SERVICE		
Hostname	FIXED		Machine name
IP Address	FIXED		Machine IP Address
Worklist provider (DIS)	SERVICE	None	A Remote Node can be selected from the list of Remote Nodes, which do have configured a Worklist AE as SCP.
Query interval	SERVICE	0 Minutes	The default setting (0 Minute) means, that no query will be initiated (off).
Time to keep unassigned worklist items after disappearance from DIS	SERVICE	180 Minutes	
Time window for scheduled procedure step start date	SERVICE	1 day into the past 1 day into the future	
Worklist Query Attributes and their values	SERVICE		The user can select the Return Key attributes for Worklist Queries.
Matching criteria to use for Worklist Query	SERVICE		The user can add matching criteria for Modality (0008.0060), Application Entity Title (0040,0001) and Performing Physician (0040,0006). The user can select two additional DICOM Attribute from a list and provide some matching criteria for them.
Remote Configuration Parameters – Worklist			
Parameter	**Configurable**	**Default Value**	**Comments**
Called AE Title (Association Acceptor)	SERVICE		
Port	SERVICE	1024	Value range: 1 – 65536
Logical Name	SERVICE		
Location	SERVICE		
Hostname	SERVICE		
IP Address	SERVICE		
Use encrypted DICOM communication for outgoing connections	SERVICE	(not set)	

6.2.2 Modality Performed Procedure Step Service Configuration

Table 6.2-2 lists Modality Performed Procedure Step Service configuration parameters:

Table 6.2-2 MPPS Service Parameters

Local Configuration Parameters – MPPS			
Parameter	**Configurable**	**Default Value**	**Comments**
Calling AE Title (Association Initiator)	SERIVCE	The machine name	
Called AE Title (Association Acceptor)	SERVICE	The machine name	
Port	SERVICE	104	Value range: 1 – 65536
TLS-Secured-Port	SERVICE	2762	Value range: 1 – 65536
Logical Name	SERVICE		
Location	SERVICE		The physical location of the machine representing the Remote Node.
Only allow encrypted DICOM communication for incoming connections	SERVICE	(not set)	
Hostname	FIXED		Machine name
IP Address	FIXED		Machine IP Address
Remote Configuration Parameters – MPPS			
Parameter	**Configurable**	**Default Value**	**Comments**
Called AE Title (Association Acceptor)	SERVICE		
Port	SERVICE	5207	Value range: 1 – 65536
Logical Name	SERVICE		
Location	SERVICE		
Use encrypted DICOM communication for outgoing connections	SERVICE	(not set)	
Hostname	SERVICE		
IP Address	SERVICE		
Send procedure step to <Remote Node Name> when requested procedure was scheduled from <Worklist provider (DIS)> (see Table 6.2-1 Worklist Service Parameters)	SERVICE	(none selected)	For every Worklist Provider Remote Node (DIS) one line is displayed. Every line or none can be selected.
Send procedure step to <Remote Node> when requested procedure was unscheduled (locally generated)	SERVICE	(none selected)	For every Worklist Provider Remote Node (DIS) one group is displayed. Every line or none can be selected.
For <Remote Node Name> send progress notification to this destination	SERVICE	(selected)	
For <Remote Node Name> send MMPS messages to this destination even after completion	SERVICE	(selected)	

6.2.3 Unified Worklist and Procedure Step Service Configuration

N/A

6.2.4 Instance Availability Notification Service Configuration

N/A

6.2.5 Storage Service Configuration

Table 6.2-3 lists Storage Service configuration parameters:

Table 6.2-3 Storage Service Parameters

Local Configuration Parameters – Storage			
Parameter	**Configurable**	**Default Value**	**Comments**
Calling AE Title (Association Initiator)	SERVICE	The machine name	
Called AE Title (Association Acceptor)	SERVICE	The machine name	
Port	SERVICE	104	Value range: 1 – 65535
TLS-Secured Port	SERVICE	2762	Value range: 1 – 65535
Logical Name	SERVICE		
Location	SERVICE		
Only allow encrypted DICOM communication for incoming connections	SERVICE	false	If set, the Local Node will only accept encrypted communication (TLS handshake).
Hostname	FIXED		Machine name
IP Address	FIXED		Machine IP Address
Transfer Syntax Optimization	SERVICE	Uncompressed Format (low CPU load)	The user can select, if syngo CT should favor compressed or uncompressed syntax.
Remote Configuration Parameters – Storage			
Parameter	**Configurable**	**Default Value**	**Comments**
Calling AE Title (Association Initiator)	SERVICE		
Called AE Title (Association Acceptor)	SERVICE		
Port	SERVICE	5104	Value range: 1 – 65536
TLS-Secured Port	SERVICE	2762	Value range: 1 – 65536
Logical Name	SERVICE		
Location	SERVICE		
Only allow encrypted DICOM communication for outgoing connections	SERVICE	(not set)	
Hostname	SERVICE		
IP Address	SERVICE		
Transfer Syntaxes to be Excluded (Association Initiator)	SERVICE		Transfer Syntaxes can be excluded for all SOP Classes or for specific SOP Classes. If excluded, no Association Request with the excluded Transfer Syntaxes will be sent.
Header Correction Ruleset (Association Initiator)	SERVICE		The selected Header Correction Ruleset will be applied for DICOM Data to be sent.

			Beside a default list of Header Correction Ruleset, the User can define own Header Correction Rulesets.
Storage Commitment (Association Initiator)	SERVICE	ENABLED	If Storage Commitment is disabled, the archive state is only updated based on the transfer result. Permanent data storage is not ensured, and data loss may result.
Encapsulate Non-Supported Objects (Association Initiator)	SERVICE	ENABLED (Basic Text Structured Report Format)	If the User enables this option, non-supported objects will be encapsulated in the "Basic Text Structured Report" or "Secondary Capture Image" format depending on the user's selection.
Transfer Syntaxes to be Excluded (Association Acceptor)	SERVICE		Transfer Syntaxes can be excluded for all SOP Classes or for specific SOP Classes. Presentation Contexts for excluded Transfer Syntaxes in incoming Association Requests will be rejected.
Header Correction Ruleset (Association Acceptor)	SERVICE		The selected Header Correction Ruleset will be applied for DICOM Data received. Beside a default list of Header Correction Ruleset, the User can define own Header Correction Rulesets.
Series Complete Delay (Association Acceptor)	SERVICE	0	Delay between a Receive Job is finished, and the received series are considered as complete, in seconds.

6.2.6 Storage Commitment Service Configuration

Table 6.2-4 lists Storage Commitment Service configuration parameters:

Table 6.2-4 Storage Commitment Service Parameters

Local Configuration Parameters – Storage Commitment			
Parameter	**Configurable**	**Default Value**	**Comments**
Calling AE Title (Association Initiator)	SERVICE	The machine name	
Called AE Title (Association Acceptor)	SERVICE	The machine name	
Port	SERVICE	5104	Value range: 1 – 65536
TLS-Secured Port	SERVICE	2762	Value range: 1 – 65536
Logical Name	SERVICE		
Location	SERVICE		
Use encrypted DICOM communication for incoming connections	SERVICE	(not set)	
Hostname	FIXED		Machine name
IP Address	FIXED		Machine IP Address
Remote Configuration Parameters – Storage Commitment			
Parameter	**Configurable**	**Default Value**	**Comments**
Calling AE Title (Association Initiator)	SERVICE		

Called AE Title (Association Acceptor)	SERVICE		
Port	SERVICE	5104	Value range: 1 – 65536
TLS-Secured Port	SERVICE	2762	Value range: 1 – 65536
Logical Name	SERVICE		
Location	SERVICE		
Only allow encrypted DICOM communication for outgoing connections	SERVICE	(not set)	
Hostname	SERVICE		
IP Address	SERVICE		
Timeouts and Retries – Delay Time	SERVICE	10 Minutes	Value range: 0 – 14400 Minutes
Timeouts and Retries – Result Timeout	SERVICE	60 Minutes	Value range: 0 – 14400 Minutes
Timeouts and Retries – Number of Retries	SERVICE	1	Value range: 1 – 100
Sending of N-Action - Bundled Call	SERVICE	ENABLED	This setting determines whether the system will send an N-Action for each object separately or bundled per transfer job.

6.2.7 Query/Retrieve Service Configuration

Table 6.2-5 lists Query/Retrieve Service configuration parameters:

Table 6.2-5 Query/Retrieve Service Parameters

Local Configuration Parameters – Query/Retrieve			
Parameter	**Configurable**	**Default Value**	**Comments**
Calling AE Title (Association Initiator)	SERVICE	The machine name	
Called AE Title (Association Acceptor)	SERVICE	The machine name	
Port	SERVICE	104	Value range: 1 – 65536
TLS-Secured Port	SERVICE	2762	Value range: 1 – 65536
Logical Name	SERVICE		
Location	SERVICE		
Use encrypted DICOM communication for incoming connections	SERVICE	(not set)	
Hostname	FIXED		Machine name
IP Address	FIXED		Machine IP Address
Remote Configuration Parameters – Query/Retrieve			
Parameter	**Configurable**	**Default Value**	**Comments**
Calling AE Title (Association Initiator)	SERVICE		
Called AE Title (Association Acceptor)	SERVICE		
Port	SERVICE	5104	Value range: 1 – 65536
TLS-Secured Port	SERVICE	2762	Value range: 1 – 65536
Logical Name	SERVICE		
Location	SERVICE		

Only allow encrypted DICOM communication for outgoing connections	SERVICE	(not set)	
Hostname	SERVICE		
IP Address	SERVICE		

6.2.8 Print Management Service Configuration

Table 6.2-6 lists Print Management Service configuration parameters:

Table 6.2-6 Print Management Service Parameters

Local Configuration Parameters – Print Management			
Parameter	**Configurable**	**Default Value**	**Comments**
Calling AE Title (Association Initiator)	SERVICE	The machine name	
Logical Name	SERVICE		If this is set, the user will see the Logical Name in the list of the Remote Nodes (otherwise the Host Name).
Location	SERVICE		
Only allow encrypted DICOM communication for outgoing connections	SERVICE	(not set)	
Hostname	FIXED		Machine name
IP Address	FIXED		Machine IP Address
Look Up Tables (LUT)	SERVICE		For every image type the user can select a Correction Look Up Table and a Density. The standard set of Look Up Tables can be extended by the consumer of <program>
Remote Configuration Parameters – Print			
Parameter	**Configurable**	**Default Value**	**Comments**
Called AE Title (Association Acceptor)	SERVICE		
Port	SERVICE	104	Value range: 1 – 65536
Logical Name	SERVICE		
Location	SERVICE		
Only allow encrypted DICOM communication for outgoing connections	SERVICE	(not set)	If set, the Local Node will only accept encrypted communication (TLS handshake).
Hostname	SERVICE		
IP Address	SERVICE		
Composing Parameter – Attached LUT Mode	SERVICE	LinearLut 12 bit support	Value range: LinearLut, BartenLut, CorrectionLut. For every LUT Mode the user can select 8 or 12 bit support
Composing Parameter – Illumination	SERVICE	2000 cd/m²	Value range: 1 – 10000 cd/m² This value can only be set, if the Attached LUT Mode is set to BartenLut.
Composing Parameter – Reflected Ambient Light	SERVICE	10 cd/m²	Value range: 0 – 100000 cd/m² This value can only be set, if the Attached LUT Mode is set to BartenLut.

Composing Parameter – Supported Films/Papers	SERVICE	(all selected)	The user can select, which Films and/or Papers are supported. For each format the width and height (both for Portrait and Landscape format) and the Medium (Paper, ColorPaper, ClearFilm, BlueFilm) can be selected.
Supported Media	SERVICE	ColorPaper selected	The user can select the Supported Media and for each one the Pixel Width and Height in µm, Min and Max Density and the Background Color (White or Black)
Timeout & Delay – Printer Status Polling Interval	SERVICE	300 Seconds	Value range: 60 – 300 Seconds
Timeout & Delay – Inactivity Timeout	SERVICE	60 Seconds	Value range: 5 – 180 Seconds

6.3 Configuration of DICOM Web Services

N/A

6.4 Configuration of Media Storage Service

Table 6.4-1 lists configuration parameters for the Media Storage service.

Table 6.4-1 Media Storage Service Parameters

Local Configuration Parameters - Media Storage Service			
Parameter	**Configurable**	**Default Value**	**Comments**
Default Media Compression	SERVICE	Priority 1: JPEG Lossless; Non-Hierarchical; First-Order Prediction (Process 14) Priority 2: (not set) Priority 3: (not set)	The values can be selected from a list. All three values must be different or not set.
DICOM Export Path	SERVICE	(not set)	Beside entering the target path of the export operation, the user can select from a list pre-defined DICOM Export Path values.
Compressed	SERVICE	not set	If set, the first fitting compression algorithm will be selected from the Default Media Compression list. If nothing fits, no compression will take place.
Create DICOM File System	SERVICE	set	If set, the export will create DICOMDIR. If not set, the data will be exported in the selected directory as one file per Instance.
Include Image Viewer on Disc	SERVICE	not set	If set, a viewer will be placed on the target medium. This option is only available, if an export takes place, creating DICOM File System.

Image Conversion	SERVICE	Enhanced	This option is only relevant if MR Multiframe images are exported. Setting it to Enhanced will result in the exportation of MR Multiframe Images as they are. Setting it to Interoperability will result in the exportation of MR Multiframe Image split up.
Data Minimization	SERVICE	not set	If set, a Data Minimization of the exported data takes place.
Profile	SERVICE	High Privacy	Only relevant if Data Minimization is set. Selects the type of the Data Minimization to be applied. High Privacy, Reduced Privacy and Low Privacy.
Pseudonym	SERVICE	(not set)	Specifies the Pseudonym that is going to be used in the Data Minimization process.
Media Burning Profiles	SERVICE	Patient Medium	It is an extendable list of profiles, which contain a set of following settings: Compressed, Create DICOM Files System, Include Image Viewer on Disc, Image Conversion, Data Minimization, Profile and Pseudonym. Those Profiles are only used by burning data on optical drives.

6.5 Configuration of Real Time Video Service

N/A

6.6 Configuration of Audit Trail - Syslog

Audit Trails can be created locally and remotely. If it is created remotely the log records will be sent to an external server. The remote logging can be switched on or off. This does not affect the local logging behavior.

Table 6.6-1 lists configuration parameters for the Audit Trail Originator.

Table 6.6-1 Audit Trail Collector Parameters

Originator Audit Trail Message Transmission - SYSLOG Parameters			
Parameter	**Configurable**	**Default Value**	**Comments**
Host Name	SERVICE		This is the name of the *remote* host.
Port	SERVICE	0	
Protocol	SERIVCE	TCP	The possible values are: Secure TCP, TCP and UDP
Certificate Thumbprint	SERVICE		

7 Network and Media Communication Details

7.1 General

The cross interaction between the AEs is depicted in the diagrams below.

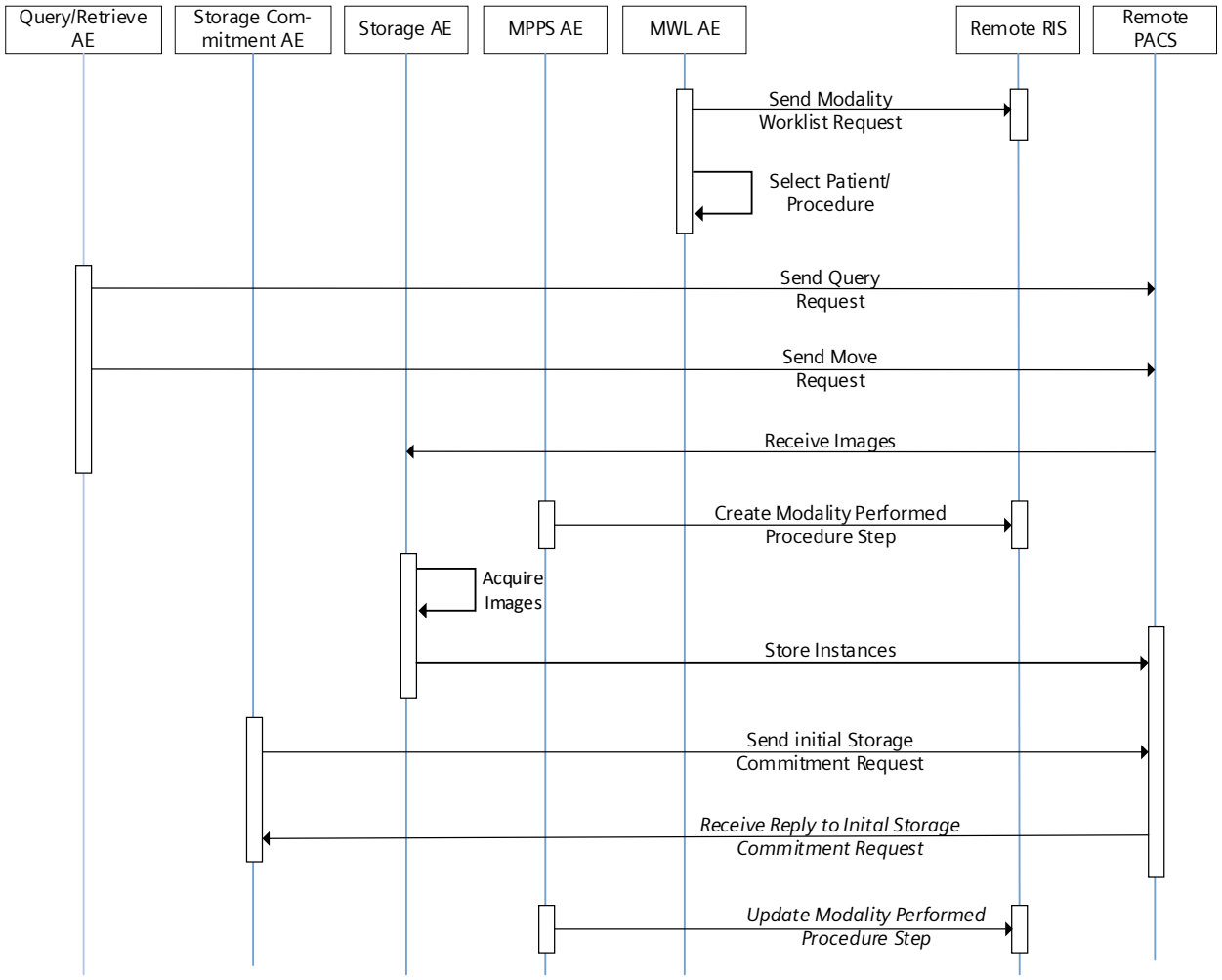


Figure 7.1-1: ***Real-World Activity and Cross AE interaction***

7.1.1 General Association Parameters

Table 7.1-1 lists Association parameters applicable to all AEs on the system.

Table 7.1-1 General Association Parameters

Type	Name	Value
Networking Services	DICOM Application Context Name	1.2.840.10008.3.1.1.1
	Implementation Class UID	1.3.12.2.1107.5.1.7
	Implementation Version Name	SIEMENS_S10VB20A
	PDU size	Default 32kb
	Maximum PDU Length	512kb
	ARTIM Timeout	30 seconds
	Maximum number of simultaneous Associations as Association Initiator	unlimited[1)]
	Maximum number of simultaneous Associations as Association Acceptor	12[2)]
	Maximum number of outstanding asynchronous Transactions	10[3)]
Media Services	File Meta Information Version	0001
	Implementation Class UID	1.3.12.2.1107.5.1.7
	Implementation Version Name	SIEMENS_S10VB20A

[1)] There is no inherent limit to the number of outgoing Associations, other than limits imposed by the computer Operating System.

[2)] The maximum number of simultaneous receiving Associations is configurable at run time, based on the system resources available. By default, the maximum number of Associations is set to 12.

[3)] syngo CT supports asynchronous communication (multiple outstanding transactions over a single Association). On the SCU side the Window size proposed is infinite. On the SCP side any size is supported.

7.1.2 Common Real-World Activities

Since all AEs support the Verification SOP Class in their role (SCP, SCU or both), this document provides a single description for those in this Section.

Furthermore, a brief description about the common aspects of the Association Acceptance Policies is presented.

The following sub-sections describe Real-World Activities that are supported by all AEs defined in Section 7.2. The Sequencing of these common Real-World Activities is shown in Figure 7.1-2:

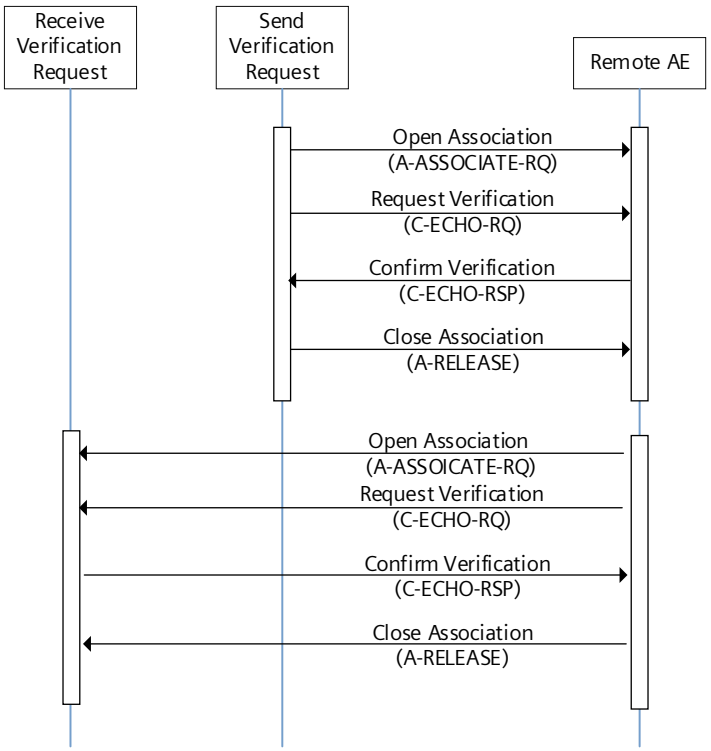


Figure 7.1-2 Common *Real-World Activities*

7.1.2.1.1 Association Initiation Policy

Based on the security settings for the Local DICOM Node and the configured Remote DICOM Nodes, a secure or an unsecure communication channel will be initialized. The connection request will be sent using this channel.

7.1.2.1.2 Real-World Activity "Send Verification Request"

syngo CT serves as an SCU of the Verification Service Class. A C-ECHO-RQ is initiated by the Administrator Portal whenever "Verification" is requested. If an Association to a remote Application Entity is successfully established, Verification with the configured AET is requested via the open Association. The C-ECHO-RSP from the remote Application can only indicate a status of Success, according to the DICOM Standard. Thus, on receiving a C-ECHO-RSP in the limits of the Transfer Inactivity Timeout (see Table 6.1-1) from the configured AET, the Verification is regarded as successful.

7.1.2.1.3 Association Acceptance Policy

7.1.2.1.3.1 Based on the calling AE Title

The user can configure if syngo CT should accept Association Requests from any calling AE Title or only from those belonging to configured Remote Nodes, called known AE Titles.

If only calls from known AE Titles are accepted, the network connection is established, and the calling AE Title can send the A-ASSOCIATE-RQ. syngo CT will reject Association Requests coming from unknown AE Titles (A-ASSOCIATE-RJ, Result: permanent, Source: 1, Reason/Diag.: 3 - calling-AE-title-not-recognized).

If calls from any AE Titles are accepted, Association Requests from all calling AE Titles will be accepted (A-ASSOCIATE-AC).

7.1.2.1.3.2 Based on the security settings for the Local and Remote DICOM Nodes

The user can impose via configuration secure and encrypted communication. This can affect only one Remote Node, which means, only the communication with the AE Title belonging to the respective Remote Node must be secure and encrypted.

If the Remote Node tries to open an unsecure and unencrypted network connection, the connection will be rejected (A-ASSOCIATE-RJ, Result: permanent, Source: 1, Reason/Diag.: 3 - calling-AE-title-not-recognized). In this case no DICOM Messages are going to be exchanged.

The user can also impose via configuration that syngo CT only accepts secure connections. In this case every unsecure and unencrypted connection attempt, will be rejected, before any DICOM Message can be sent.

In this case is the setting of accepting all calling AE Titles, due to technical reasons, ineffective. Only Association Requests from known calling AE Titles will be accepted.

7.1.2.1.4 Real-World Activity "Receive Verification Request"

syngo CT serves as an SCP of the Verification Service Class. If the Verification SCP accepts an Association, it will respond to C-ECHO-RQ. If the Called AE Title does not match any pre-configured AE Title shared by all SCP, the Association will be rejected.

The C-ECHO-RSP always indicates a successful operation.

7.2 Specifications

7.2.1 Storage Application Entity

7.2.1.1 Sequencing of Real-World Activities for Storage AE

Figure 7.2-1 shows the Sequencing of the Real-World Activities for the Storage AE.

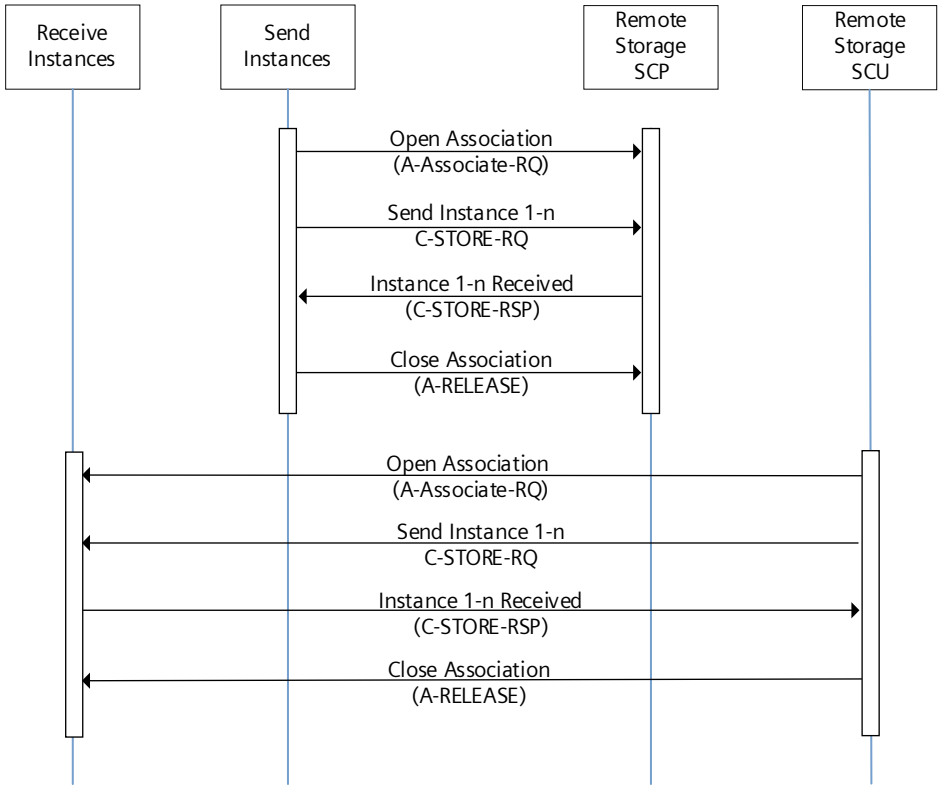


Figure 7.2-1 Real-World Activities for Storage AE

As a SCU, syngo CT starts sending the selected Instances after the Association has been accepted. After all Instances are sent, syngo CT closes the Association.

As a SCP, syngo CT starts receiving Instances in the negotiated Transfer Syntax, after the Association has been accepted.

In addition to the Real-World Activities described in this Section, syngo CT also supports all Real-World Activities listed in Section 7.1.2.

7.2.1.2 Association Parameters of Storage AE

Association parameters are common to all AEs and documented in Table 7.1-1.

7.2.1.3 Association Initiation

This Section details the Association policies of the Storage Application Entity when it is initiating an Association.

For general information regarding the Association initiation policies please see Section 7.1.2.1.1.

7.2.1.3.1 Real-World Activity “Send Verification Request”

The Storage AE supports the Verification SOP Class. For further details please see Section 7.1.2.1.2

7.2.1.3.2 Real-World Activity “Send Instances”

The Storage SCU of syngo CT is triggered by the transfer job queue or by an external retrieve request. An Association request is sent to the Remote Storage SCP. One Presentation Context is proposed for each SOP Class/Transfer Syntax combination. For details on the selection of the actual Transfer Syntax among the ones accepted by the Remote Storage SCP, refer to Section 0). Upon successful negotiation of a Presentation Context, the transfer is started. All Instances will be transferred sequentially on the same open Association. Instances are sent asynchronously without waiting for the response status from the Remote Storage SCP. If no suitable Presentation Context is found, the Association will be aborted.

If the limit of 128 (as mentioned in the DICOM Standard) is exceeded, multiple Transfer Syntaxes are offered in one Presentation Context.

SCP/SCU Role Selection Negotiation SCP/SCU Role Selection Negotiation

N/A

Transfer Syntax Selection Policies

syngo CT offers a basic option for Transfer Syntax selection, for favoring uncompressed formats (for low CPU load) or compressed format (for low network load). A certain selection does not lead in a deterministic manner to the usage of a compressed or uncompressed Transfer Syntax, since before every transfer an Association Negotiation takes place.

Beside this option it is possible to exclude Transfer Syntaxes for both SCP and SCU site. The exclusion can be a general one (excluding certain Transfer Syntax or Transfer Syntaxes for all SOP Classes) or a specific one (excluding certain Transfer Syntaxes for specific SOP Classes). This can also be configured on the Administration Portal.

The exclusion of Transfer Syntaxes is deterministic. They will not be offered (SCU side) or accepted (SCP side) during the Transfer Syntax Negotiation.

All the supported Transfer Syntaxes (see Table 1.1-2 Supported Transfer Syntaxes) can be excluded both generally and for specific SOP Classes. All non-image related Storage SOP Classes from Table 1.1-1 Storage SOP Classes can be used as in the specific Transfer Syntax exclusion.

Using the Transfer Syntax exclusion compression can be enforced by excluding all the Transfer Syntaxes, except for the requested compressed one.

This is a setting, that can be applied to every Remote Node, both on Association Initiator and Association Acceptor side.

An Instance will be JPEG lossless compressed only if it fulfills the following criteria:

- Is an image and not already compressed
- Photometric Interpretation (0028,0004) is either MONOCHROME1, MONOCHROME2, RGB, YBR_FULL
- Bits Allocated (0028,0100) equal to '16 or '8'
- Bits Stored (0028,0101) equal to '12' or '8'
- High Bit (0028,0102) equal to Bits Stored (0028,0101) – 1
- Pixel Representation (0028,0103) equal to '0'

An Instance will be JPEG 2000 lossy compressed during transfer only if the following criteria is fulfilled:

- Is an image
- Photometric Interpretation (0028,0004) is either MONOCHROME1, MONOCHROME2 or RGB, YBR_FULL, YBR_FULL_244
- Bits Allocated (0028,0100) equal to '16' or '8'
- Bits Stored (0028,0101) equal to '12' or '8'
- High Bit (0028,0102) equal to Bits Stored (0028,0101) – 1
- Pixel Representation (0028,0103) equal to '0'
- Only lossy Transfer Syntaxes are supported (Implicit Little Endian is not supported) at the remote side

An Instance will be JPEG 2000 lossless compressed only if it fulfills the following criteria:

- Is an image and not already compressed
- Photometric Interpretation (0028,0004) is either MONOCHROME, RGB, YBR_FULL or YBR_FULL_422
- Bits Allocated (0028,0100) equal to '16' or '8'

An Instance will be RLE lossless compressed only if it fulfills the following criteria:

- Is an image and not already compressed
- Photometric Interpretation (0028,0004) is MONOCHROME, RGB, YBR_FULL or RGB
- Bits Allocated (0028,0100) '8' or '16' for MONOCHROME, '24' for other interpretations

An Instance will be JPEG 2000 lossy compressed during transfer only if the following criteria is fulfilled:

- Is an image
- Photometric Interpretation (0028,0004) is MONOCHROME, YBR_FULL or RGB
- Bits Stored (0028,0101) equal to '12' or '8'
- Only lossy Transfer Syntaxes are supported (Implicit Little Endian is not supported) at the remote side

An Instance will be JPEG Baseline (Process 1) compressed only if it fulfills the following criteria:

- Is an image
- (0028,0004) Photometric Interpretation value is MONOCHROME1
- (0028,0100) Bits Allocated value is 8
- (0028,0101) Bits Stored value is 8
- (0028,0102) High Bit value is 8
- Only lossy Transfer Syntaxes are supported (Implicit Little Endian is not supported) at the remote side

An Instance will be JPEG Extended (Process 2 & 4) compressed only if it fulfills the following criteria:

- Is an image
- (0028,0004) Photometric Interpretation value is MONOCHROME1
- (0028,0100) Bits Allocated value is 16
- (0028,0101) Bits Stored value is 12
- (0028,0102) High Bit value is 11
- Only lossy Transfer Syntaxes are supported (Implicit Little Endian is not supported) at the remote side

Proposed Presentation Contexts

syngo CT proposes one Presentation Context for each SOP Class/Transfer Syntax combination in the A-ASSOCIATE-RQ. The number of Presentation Contexts in an A-ASSOCIATE-RQ message is limited to 128.

7.2.1.4 Association Acceptance

This Section details the Association policies of the Application Entity when it is acceptor for an Association.

For general information regarding the Association acceptance policies please see Section 7.1.2.1.3.

7.2.1.4.1 Real-World Activity "Receive Verification Request"

The Storage AE supports the Verification SOP Class. For further details please see Section 7.1.2.1.4.

7.2.1.4.2 Real-World Activity "Receive Instances"

Upon receiving an Instance, syngo CT returns the status "SUCCESS" after a minimal image header validation has been performed.

The following header attributes must be available and filled:

- SOP Class UID - (0008,0016),
- SOP Instance UID - (0008,0018)
- Study Instance UID - (0020,000D),
- Series Instance UID - (0020,000E)
- Number of Frames - (0028,0008), applies for multi frame images only and
- Rows – (0028,0010).

Note that depending on the system configuration, a status of SUCCESS does not necessarily guarantee that the Instances and header information are stored in the local database.

Accepted Presentation Contexts

When receiving an Association request from a remote node, syngo CT accepts all Presentation Context containing a Transfer Syntax configured for that node. If multiple Transfer Syntaxes are proposed within one Presentation Context, syngo CT selects it based on the configured preference order configured for that node. The preference order is the order of occurrence of the Transfer Syntaxes in the configuration. For each node it is possible to select Transfer Syntaxes, that can be used, and Transfer Syntaxes, that are excluded. The configuration can even be extended, based on the combination of SOP Classes and supported Transfer Syntaxes.

Table 1.1-1 Storage SOP Classes and Table 1.1-2 Supported Transfer Syntaxes lists all Transfer Syntaxes that are supported for the SOP Instances.

Generally, all Presentation Contexts are accepted if they contain at least one suitable Transfer Syntax. All other Presentation Contexts are rejected.

Extended Negotiation

The Extended Negotiation parameters for all services that are requested by the Application Entity for the Real-World Activity "Receive Instances" are described in Table 7.2-1 Extended Negotiation for Receive Instances of Storage AE - Association Acceptance.

Table 7.2-1 Extended Negotiation for Receive Instances of Storage AE - Association Acceptance

SOP Class	Extended Negotiation	Support	Value
Storage			
Applicable to all storage SOP Classes listed under Section 1.1.	Level of storage support	Y	0
	Level of Digital Signature support	Y	0

	Element Coercion	Y	0

7.2.2 Storage Commitment Application Entity

7.2.2.1 Sequencing of Real-World Activities for Storage Commitment AE

Figure 7.2-2 shows the Sequencing of the Real-World Activities for the Storage Commitment AE.

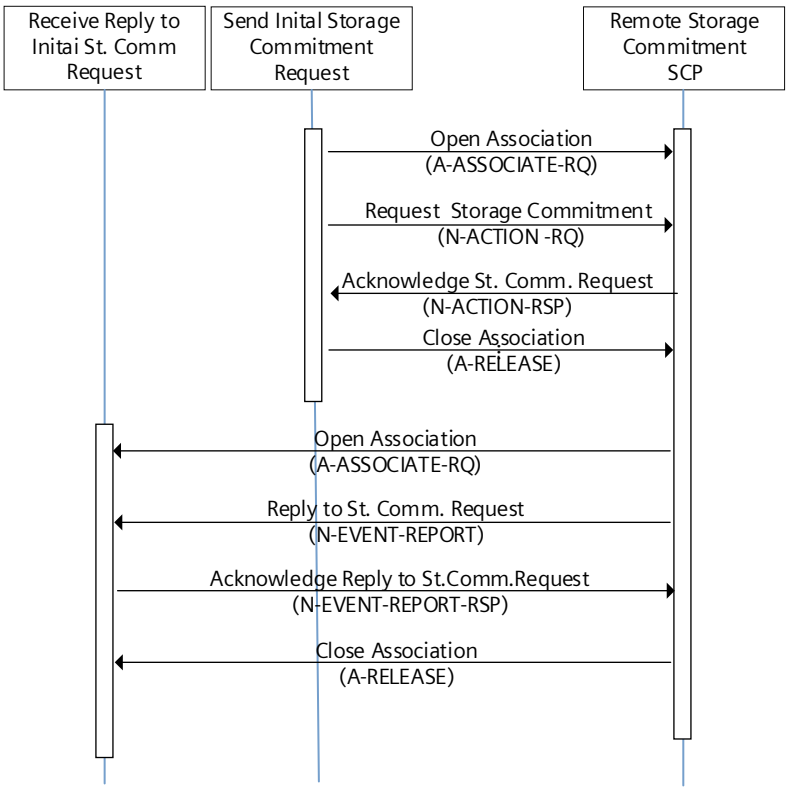


Figure 7.2-2 Real-World Activities for Storage Commitment AE

Every Storage Commitment process starts with sending Data to a Remote DICOM Node. If the respective Remote DICOM Node is configured as archive (PACS), the sender will ask for confirmation of the storage (N-ACTION-RQ). Depending on the Storage Commitment setting for the Remote Node, this can be sent for all Instances once (Bundled Call) or for each Instance separately. The Remote Node will answer accordingly.

If the request to confirm the long-term storage (N-EVENT-REPORT-RQ) is sent immediately (within 3 seconds) it will be received on the same Association. Otherwise, the Remote Storage Commitment SCP must open the Association to send the request.

In addition to the Real-World Activities described in this Section, syngo CT also supports all Real-World Activities listed in Section 7.1.2.

7.2.2.2 Association Parameters of Storage Commitment AE

Association parameters are common to all AEs and documented in Table 7.1-1.

7.2.2.3 Association Initiation

This Section details the Association policies of the Storage Commitment Application Entity when it is initiating an Association.

For general information regarding the Association initiation policies please see Chapter 7.1.2.1.1.

7.2.2.3.1 Real-World Activity “Send Verification Request”

The Storage Commitment AE supports the Verification SOP Class. For further details please see Section 7.1.2.1.2

7.2.2.3.2 Real-World Activity “Send Initial Storage Commitment Request”

syngo CT serves as an SCU of the Storage Commitment Service Class. After successful transfer of DICOM Instances to a configured archive node, syngo CT initiates a confirmation request (N-ACTION-RQ). Storage Commitment is supported for all Storage SOP Classes listed in Table 1.1-1.

Extended Negotiation

There is no extended negotiation for Storage Commitment Push Model SOP Class.

SCP/SCU Role Selection Negotiation

syngo CT supports reverse SCP/SCU Role Selection Negotiation. It can receive the N-EVENT-REPORT-RQ on a different Association or on the same Association, if received within 3 seconds after the N-ACTION-RQ was finalized.

7.2.2.3.3 Real-World Activity “Reply to Initial Storage Commitment Request”

After successfully receiving an N-ACTION-RQ syngo CT communicates the status of the Storage Commitment Request using the N-EVENT-REPORT-RQ primitive.

If the sending of the N-EVENT-REPORT-RQ fails, syngo CT will proceed to the general and configurable (Administration Portal) retry mechanism. A retry only takes place if the network issue detected is a temporary one. In case the network issue detected is classified as a permanent one, the job fails.

SCP/SCU Role Selection Negotiation

After successfully receiving an N-ACTION-RQ syngo CT communicates the status of the Storage Commitment Request using the N-EVENT-REPORT-RQ primitive using reverse SCP/SCU Role Selection Negotiations.

7.2.2.4 Association Acceptance

This Section details the Association policies of the Application Entity when it is acceptor for an Association.

For general information regarding the Association acceptance policies please see Chapter 7.1.2.1.3.

7.2.2.4.1 Real-World Activity “Receive Verification Request”

The Storage Commitment AE supports the Verification SOP Class. For further details please see Section 7.1.2.1.3.

7.2.2.4.2 Real-World Activity “Receive Initial Storage Commitment Request”

N/A

7.2.2.4.3 Real-World Activity “Receive Reply to Initial Storage Commitment Request”

syngo CT has a configurable expiration timeout for the Transaction UID. By default, the Transaction UID expires 60 minutes.

Extended Negotiation

There is no extended negotiation for Storage Commitment Push Model SOP Class.

Transfer Syntax Selection Policies

This Section describes the Transfer Syntax preference when there are multiple Transfer Syntaxes for a SOP class provided by the Association initiator for Real-World Activity "*Receive Reply to Initial Storage Commitment Request* of Storage Commitment AE of the system.

Table 7.2-2 Transfer Syntax Selection Preference Order for the Storage Commitment AE for Receive Reply to Initial Storage Commitment Request

Preference Order	Transfer Syntax	UID	Comments
1	Explicit VR Little Endian	1.2.840.10008.1.2.1	
2	Implicit VR Little Endian	1.2.840.10008.1.2	
3	Explicit VR Big Endian (Retired)	1.2.840.10008.1.2.2	

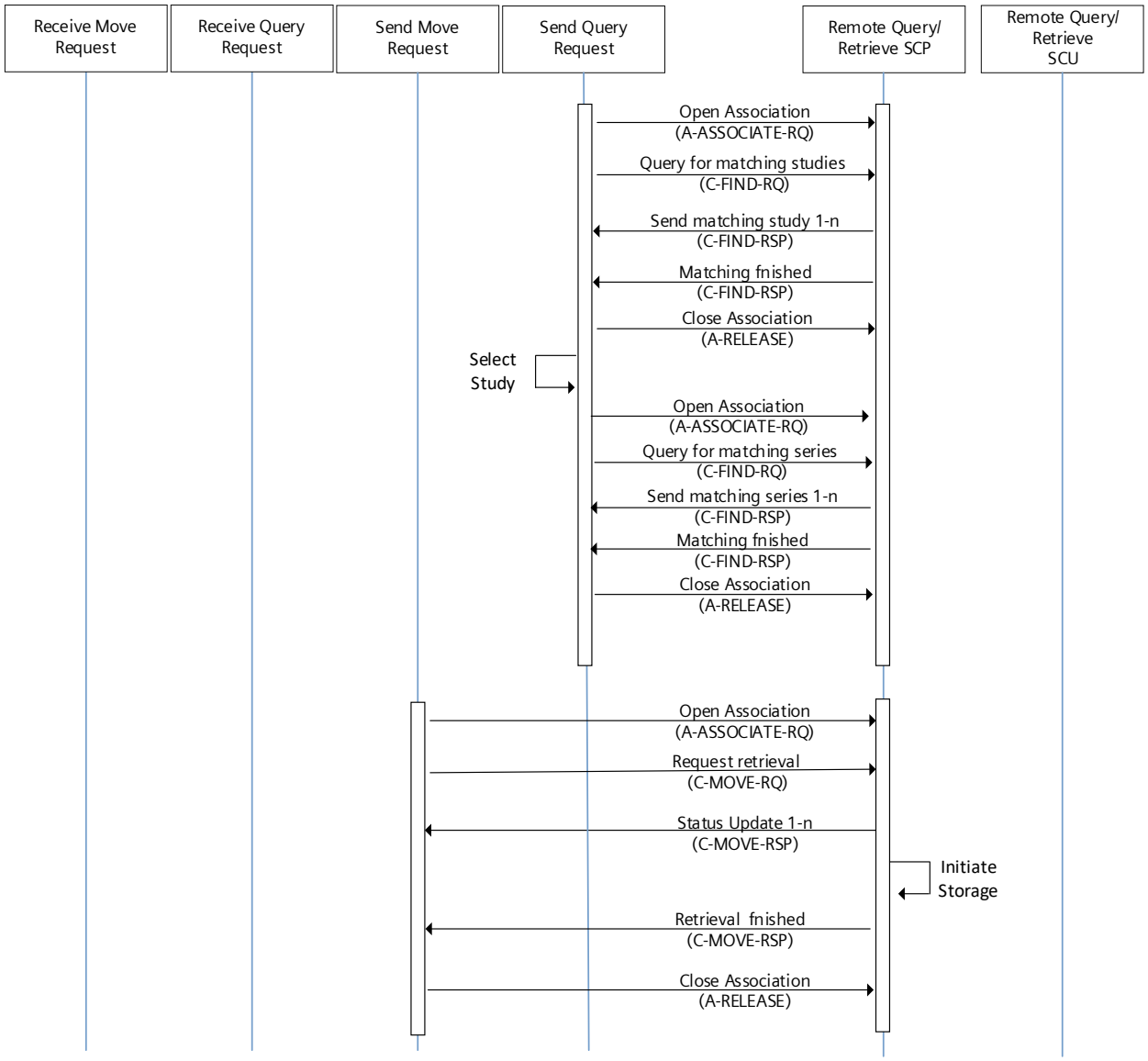
SCP/SCU Role Selection Negotiation

syngo CT supports the reverse SCP/SCU Role Selection Negotiation of the Storage Commitment Service Class as the SCU. It accepts an association request and then the incoming N-EVENT-REPORT-RQ, if they do not arrive on the same Association as the N-ACTION-RQ.

7.2.3 Query/Retrieve Application Entity

7.2.3.1 Sequencing of Real-World Activities for Query/Retrieve AE

Figure 7.2-2 shows the Sequencing of the Real-World Activities for the Query/Retrieve AE.


Receive Move Request
Receive Query Request
Send Move Request
Send Query Request
Remote Query/ Retrieve SCP
Remote Query/ Retrieve SCU
Open Association (A-ASSOCIATE-RQ)
Query for matching studies (C-FIND-RQ)
Send matching study 1-n (C-FIND-RSP)
Matching fnished (C-FIND-RSP)
Close Association (A-RELEASE)
Select Study
Open Association (A-ASSOCIATE-RQ)
Query for matching series (C-FIND-RQ)
Send matching series 1-n (C-FIND-RSP)
Matching fnished (C-FIND-RSP)
Close Association (A-RELEASE)
Open Association (A-ASSOCIATE-RQ)
Request retrieval (C-MOVE-RQ)
Status Update 1-n (C-MOVE-RSP)
Initiate Storage
Retrieval fnished (C-MOVE-RSP)
Close Association (A-RELEASE)

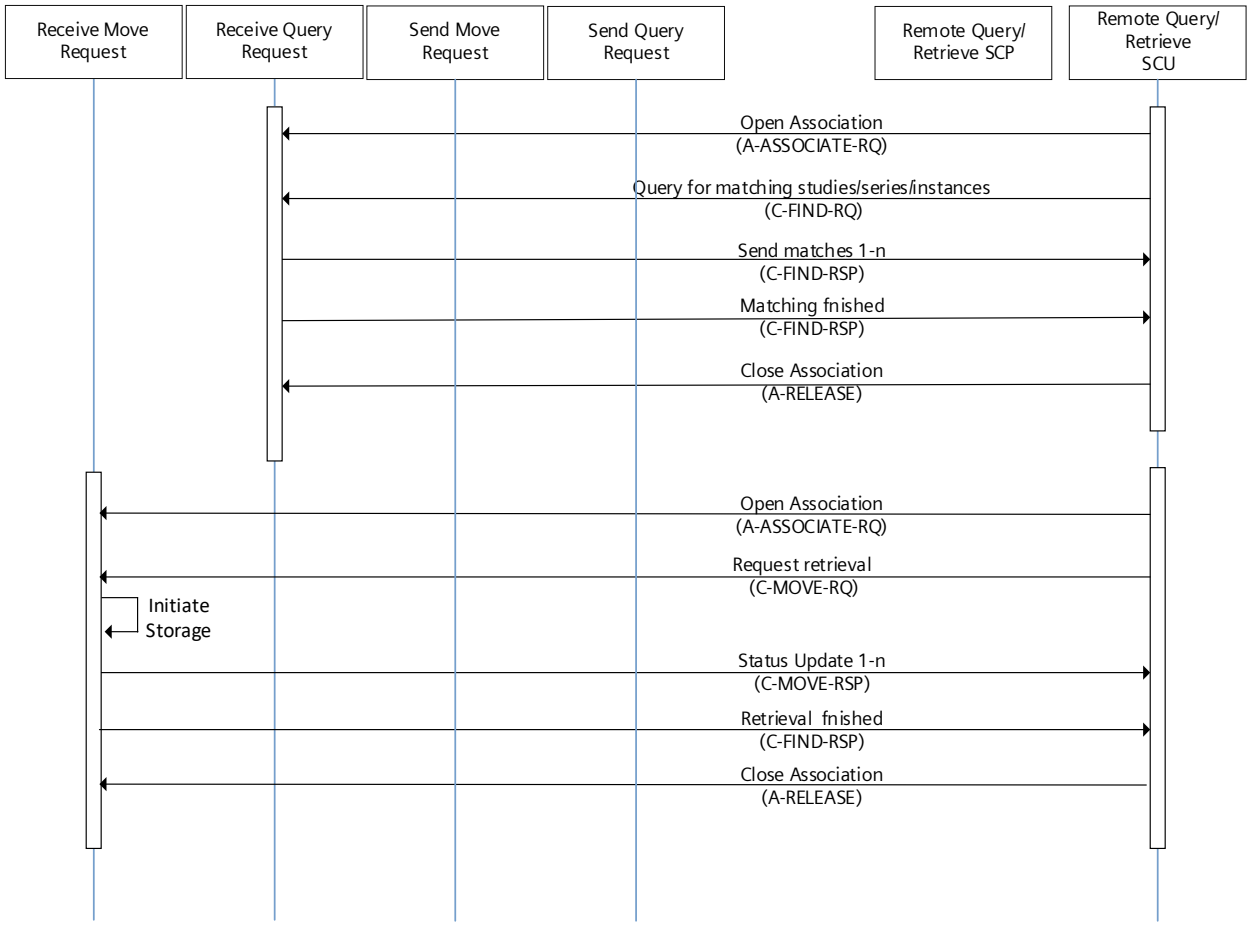


Figure 7.2-3 Real-World Activities for Query/Retrieve AE

syngo CT provides a standard GUI for Query/Retrieve. In the first step the Remote Node must be selected. The Studies found based on the search criteria entered by the user will be listed. If the user chooses a study, each one of its series will be also listed. The user can select a study or a series to retrieve. Selecting a series will retrieve its study too.

As an SCU, syngo CT opens the Association using the negotiated Study Root Q/R Information Model - FIND SOP Class. Afterwards it sends a C-FIND-RQ including query keys on the study level as provided by the user and waits for the matches in the C-FIND-RSP. In subsequent Associations the system will issue C-FIND-RQ to retrieve the Series of the selected study.

After the system finalized all queries and closed the Association for querying, the user makes his selection for retrieval. syngo CT opens an Association and issues a C-MOVE-RQ. After receiving a final status code, the Association is closed.

Receiving the Instances via C-STORE is performed by the Storage Application Entity (see Section 7.2.1.4).

As an SCP, syngo CT accepts Association requests for Study Root, Patient Root and Patient/Study Only Q/R Information Models. Upon receiving a C-FIND-RQ it returns matches for the provided keys using the C-FIND-RSP messages. Queries on all Levels (Study, Series and Instance) are processed and answered. After all matches have been communicated a C-FIND-RSP with a status of SUCCESS is sent.

Upon receiving a C-MOVE-RQ syngo CT will trigger the Storage Application Entity to send the requested Instance(s).

In addition to the Real-World Activities described in this Section, syngo CT also supports all Real-World Activities listed in Section 7.1.2.

7.2.3.2 Association Parameters of Query/Retrieve AE

Association parameters are common to all AEs and documented in Table 7.1-1.

7.2.3.3 Association Initiation

This Section details the Association policies of the Query/Retrieve Application Entity when it is initiating an Association.

For general information regarding the Association initiation policies please see Section 7.1.2.1.1.

7.2.3.3.1 Real-World Activity "Send Verification Request"

The Query/Retrieve AE supports the Verification SOP Class. For further details please see Section 7.1.2.1.2

7.2.3.3.2 Real-World Activity "Send Query Request"

syngo CT serves as an SCU for the Study Root Q/R Information Model – FIND SOP Class.

Using the attributes specified by the user as Key Attributes (in accordance with the query model) the Query/Retrieve AE initiates a C-FIND-RQ and displays the responses to the user.

Extended Negotiation

The Extended Negotiation parameters for all services that are supported by the Application Entity for the Real-World Activity "Send Query Request" are described in Table 7.2-3.

Table 7.2-3 Extended Negotiation for Send Query Request of Query/Retrieve AE Association Initiation

SOP Class	Extended Negotiation	Support	Requested Value
Query			
Applicable to all Query Retrieve – FIND SOP Classes mentioned in Section 5.	Relational-queries	Y	1
	Date-Time Matching	Y	1
	Fuzzy semantic matching of person names	Y	1
	Timezone query adjustment	N	
	Enhanced Multi-Frame Image Conversion	N	
	Empty Value Matching	N	
	Multiple Value Matching	N	

SCP/SCU Role Selection Negotiation

N/A

7.2.3.3.3 Real-World Activity "Send Move Request"

syngo CT serves as an SCU for the Study Root Q/R Information Model – MOVE SOP Class to retrieve imaging objects.

Extended Negotiation

Extended Negotiation is not supported by the Application Entity for the Real-World Activity "Send Move Request".

SCP/SCU Role Selection Negotiation

N/A

7.2.3.4 Association Acceptance

For general information regarding the Association acceptance policies please see Section 7.1.2.1.3.

7.2.3.4.1 Real-World Activity "Receive Verification Request"

The Query/Retrieve AE supports the Verification SOP Class. For further details please see Section 7.1.2.1.4.

7.2.3.4.2 Real-World Activity "Receive Query Request"

syngo CT serves as an SCP for the Study Root, Patient Root and Patient Study/Only Q/R Information Model – FIND SOP Classes.

Using the attributes specified by the user as Query Keys (in accordance with the query model) the SCP of the Query/Retrieve AE accepts a C-FIND-RQ and provides the responses for the requesting node.

Extended Negotiation

The Extended Negotiation parameters for all services that are requested by the Application Entity for the Real-World Activity "Receive Query Request" are described in Table 7.2-4.

Table 7.2-4 Extended Negotiation for Receive Query Request of Query/Retrieve AE - Association Acceptance

SOP Class	Extended Negotiation	Support	Requested Value
Query			
Applicable to all Query Retrieve – FIND SOP Classes mentioned in Section 5.	Relational-queries	Y	1
	Date-Time Matching	Y	1
	Fuzzy semantic matching of person names	Y	1
	Timezone query adjustment	N	
	Enhanced Multi-Frame Image Conversion	N	
	Empty Value Matching	N	
	Multiple Value Matching	N	

Transfer Syntax Selection Policies

This Section describes the Transfer Syntax preference when there are multiple Transfer Syntaxes for a SOP class provided by the Association initiator for Real-World Activity "Receive Query Request" of the system.

Table 7.2-5 Transfer Syntax Selection Preference Order –for Query/Retrieve AE

Preference Order	Transfer Syntax	UID	Comments
1	Explicit VR Little Endian	1.2.840.10008.1.2.1	
2	Implicit VR Little Endian	1.2.840.10008.1.2	
3	Explicit VR Big Endian (Retired)	1.2.840.10008.1.2.2	

SCP/SCU Role Selection Negotiation

N/A

7.2.3.4.3 Real-World Activity "Receive Move Request"

syngo CT serves as an SCP for the SOP Class Study Root Q/R Information Model – MOVE SOP Class.

The C-MOVE-RQ is used to retrieve the selected imaging objects. The Retrieve AE supports the query model Study Root only.

Extended Negotiation

Extended Negotiation parameters for the Real-World Activity "Receive Move Request" are not supported.

Transfer Syntax Selection Policies

This Section describes the Transfer Syntax preference when there are multiple Transfer Syntaxes for a SOP class provided by the Association initiator for Real-World Activity "Receive Move Request" of the system.

Table 7.2-6 Transfer Syntax Selection Preference Order – Non-Image SOP Classes for Query/Retrieve AE

Preference Order	Transfer Syntax	UID	Comments
1	Explicit VR Little Endian	1.2.840.10008.1.2.1	
2	Implicit VR Little Endian	1.2.840.10008.1.2	
3	Explicit VR Big Endian (Retired)	1.2.840.10008.1.2.2	

SCP/SCU Role Selection Negotiation

N/A

7.2.4 Modality Worklist Application Entity

7.2.4.1 Sequencing of Real-World Activities for Modality Worklist AE

Figure 7.2-2 shows the Sequencing of the Real-World Activities for the Modality Worklist AE.

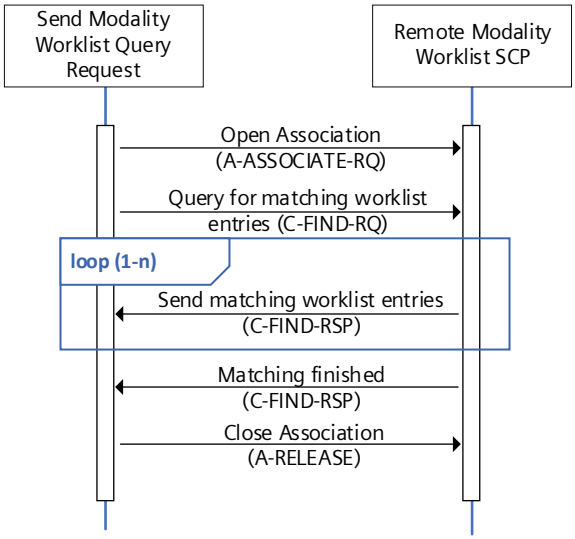


Figure 7.2-4: Real-World Activities for Modality Worklist AE

As a SCU, syngo CT opens an Association for querying the Modality Worklist by issuing C-FIND-RQ. It receives the matching worklist entries in a C-FIND-RSP with a "Pending status". Matching worklist entries will be displayed in the patient browser. Upon receiving a final a C-FIND-RSP with a "Success status" the Association is closed.

For every node it can be configured which events should trigger the sending of the message (scheduled or unscheduled/locally created). The user can also configure if syngo CT should send progress notifications or a message on completion.

7.2.4.2 Association Parameters of Modality Worklist AE

Association parameters are common to all AEs and documented in Table 7.1-1.

7.2.4.3 Association Initiation

This Section details the Association policies of the Modality Worklist Application Entity when it is initiating an Association.

For general information regarding the Association initiation policies please see Section 7.1.2.1.1.

7.2.4.3.1 Real-World Activity "Send Verification Request"

The Modality Worklist AE supports the Verification SOP Class. For further details please see Section 7.1.2.1.2

7.2.4.3.2 Real-World Activity "Send Modality Worklist Request"

syngo CT initiates a Modality Worklist query either in regular configurable time intervals or when triggered manually by the user.

Extended Negotiation

The Extended Negotiation parameters for all services that are supported by the Application Entity for the Real-World Activity "Send Modality Worklist Request" are described in Table 7.2-7.

Table 7.2-7 Extended Negotiation for Send Modality Worklist Request of the Modality Worklist AE - Association Initiation

SOP Class	Extended Negotiation	Support	Requested Value
Modality Worklist			
Modality Worklist Information Model – FIND	Relational-queries	Y	1
	Date-Time Matching	Y	1
	Fuzzy semantic matching of person names	Y	1
	Timezone query adjustment	N	
	Enhanced Multi-Frame Image Conversion	N	
	Empty Value Matching	N	
	Multiple Value Matching	N	

SCP/SCU Role Selection Negotiation

N/A

7.2.4.4 Association Acceptance

N/A

7.2.5 Modality Performed Procedure Step Application Entity

7.2.5.1 Sequencing of Real-World Activities for Modality Performed Procedure Step AE

Figure 7.2-2 shows the Sequencing of the Real-World Activities for the Modality Performed Procedure Step AE.

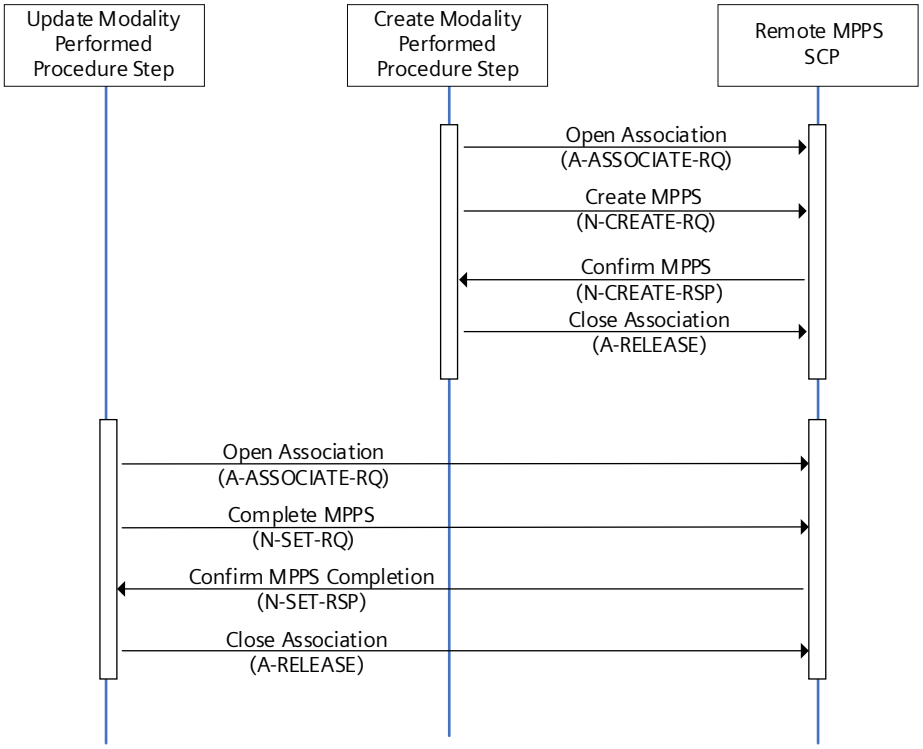


Figure 7.2-5 Real-World Activities for Modality Performed Procedure Step AE

7.2.5.2 Association Parameters of Modality Performed Procedure Step AE

Association parameters are common to all AEs and documented in Table 7.1-1.

7.2.5.3 Association Initiation

This Section details the Association policies of the Modality Performed Procedure Step Application Entity when it is initiating an Association.

For general information regarding the Association initiation policies please see Section 7.1.2.1.1.

7.2.5.3.1 Real-World Activity “Send Verification Request”

The Modality Performed Procedure Step AE supports the Verification SOP Class. For further details please see Section 7.1.2.1.2

7.2.5.3.2 Real-World Activity “Send MPPS Query”

Transfer Syntax Selection Policies

This Section describes the Transfer Syntax preference when there are multiple Transfer Syntaxes for a SOP class provided by the Association initiator for Real-World Activity "Send MPPS Query" of the system.

Table 7.2-8 Transfer Syntax Selection Preference Order –MPPS AE

Preference Order	Transfer Syntax	UID	Comments
1	Explicit VR Little Endian	1.2.840.10008.1.2.1	
2	Implicit VR Little Endian	1.2.840.10008.1.2	
3	Explicit VR Big Endian (Retired)	1.2.840.10008.1.2.2	

SCP/SCU Role Selection Negotiation

N/A

7.2.5.4 Association Acceptance

N/A

7.2.6 Print Application Entity

7.2.6.1 Sequencing of Real-World Activities for Print AE

Figure 7.2-2 shows the Sequencing of the Real-World Activities for the Print AE.

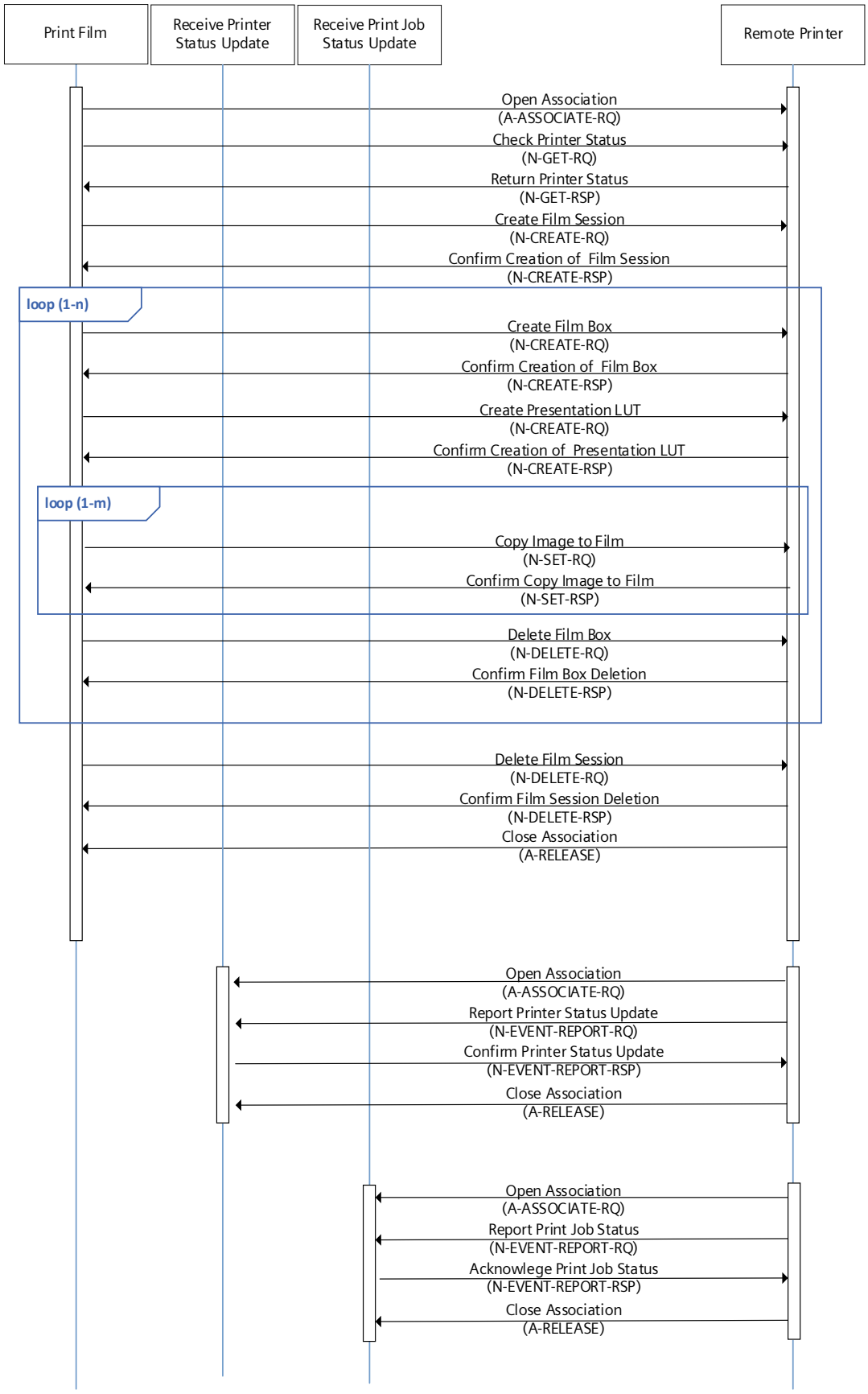


Figure 7.2-6 Real-World Activities for Print AE

As an SCU syngo CT starts the Print Film activity after checking the Printer Status using the N-GET-RQ of the Printer SOP Class. If the printer is alive, a film session will be created using the N-CREATE-RQ of the Basic Film Session SOP Class. Within the created film session all necessary films will be created using the N-CREATE-RQ of the Basic Film Box SOP Class. Afterwards all images will be copied to the film using the N-SET-RQ of either the Basic Grayscale Image Box or the Basic Color Image Box. It is possible to set a Presentation LUT for each Film using the N-CREATE-RQ of the Presentation LUT SOP Class. After the print job has been finished, all film boxes and the film session will be deleted using the N-DELETE-RQ of the respective SOP Class.

Furthermore syngo CT can asynchronously receive N-EVENT-REPORT-RQs of either the Printer SOP Class or of the Print Job SOP Class in order receive updates about the printer status or a print job status.

7.2.6.2 Association Parameters of Print AE

Association parameters are common to all AEs and documented in Table 7.1-1.

7.2.6.3 Association Initiation

This Section details the Association policies of the Print Application Entity when it is initiating an Association.

For general information regarding the Association initiation policies please see Section 7.1.2.1.1.

7.2.6.3.1 Real-World Activity “Send Verification Request”

The Print AE supports the Verification SOP Class. For further details please see Section 7.1.2.1.2

7.2.6.3.2 Real-World Activity “Print Film”

Whenever a film-sheet is prepared by the user, it is forwarded to the Printer Job queue. As soon as the associated Printer device is available the job is activated, and an Association is established.

After the film sheet is internally processed, converted to a STANDARD\1,1 layout and the page image is sent to the printer, the status is controlled by awaiting any N-EVENT-REPORT message throughout the transfer until the last image or film-sheet is sent.

If the response from the remote application contains a status other than Success or Warning the printing is stopped and the job status is set to Aborted.

Extended Negotiation

N/A

SCP/SCU Role Selection Negotiation

N/A

7.2.6.3.3 Real-World Activity “Receive Printer Status Update”

The status information received in this way will be forwarded to the Printing Service implementation. If a Print Job is in progress and the received status indicates an error, the current job will be cancelled.

The status information is set for the printer in use. This is visible for the user on the printing GUI.

7.2.6.3.4 Real-World Activity “Receive Printer Job Status Update”

The status information received in this way will be forwarded to the Printing Service implementation.

The status information is set for the current job. This is visible for the user on the printing GUI.

Extended Negotiation

N/A

7.2.6.4 Association Acceptance

N/A

7.3 Status Codes

The following sections describe the Status Codes supported by the system for each implemented service as well as the reason for issuing specific Status codes respectively the associated behavior when receiving it.

7.3.1 General AE Communication and Failure Behavior and Handling

7.3.1.1 Communication Failure Behavior as Association Initiator

Table 7.3-1 describes behavior of the AE when a communication failure occurs when it initiated an Association.

Table 7.3-1 DICOM Communication Failure Behavior as Association Initiator

Failure	Failure Behavior
Timeout Occurs, if the communication with the remote AE is timed out.	The command is marked as failed. The reason is logged and reported to the user.
Association aborted Occurs if the remote AE explicitly aborts the Association (A-ABORT).	The command is marked as failed. The reason is logged and reported to the user.
Network Disconnect Occurs if the network connection to the remote AE becomes unavailable.	The command is marked as failed. The reason is logged and reported to the user.

7.3.1.2 Communication Failure Handling as Association Acceptor

Table 7.3-2 describes how the AE responds when it receives an Association request that leads to failure in communication.

Table 7.3-2 DICOM Communication Failure Handling as Association Acceptor

Exception	Failure response
Failure during processing of Association request	The command is marked as failed. The reason is logged and reported to the user.
Unrecognized Called AE	AE responds with A-ASSOCIATE reject (Calling AE title not recognize, Reason Code 03) It is possible to configure syngo CT in such a way, that all AE Titles are accepted. Is this mode set, the Association requests of all AE Titles are accepted.
Exceed limit for number of connections supported	AE responds with A-ASSOCIATE reject (Temporary congestion, Reason Code 01)

7.3.2 DIMSE Services

7.3.2.1 Basic Worklist Management Service

7.3.2.1.1 SCU of the Modality Worklist Information Model FIND SOP Class - C-FIND

Table 7.3-3 lists the Status Codes that the SCU of the Modality Worklist Information Model Find SOP Class supports for the C-FIND message and defines the application behavior when encountering the listed Status Codes.

Table 7.3-3 Status Codes for C-FIND of the Modality Worklist Information Model – FIND SOP Class - SCU

Status Class	Further Meaning	Status Code	Behavior
Success	Matching is complete - No final identifier is supplied	0000	The success is reported.
Failure	Refused: Out of Resources	A700	The issue is logged, the user is notified, and the Association is closed.
	Error: Identifier does not match SOP Class	A900	
	Error: Unable to process	C000-CFFF	
Cancel	Matching terminated due to cancel	FE00	The Association is closed.
Pending	Matches are continuing - Current Match is supplied and any Optional Keys were supported in the same manner as Required Keys.	FF00	The receiver waits for further data. As the data arrives, they are displayed to the user.
Pending	Matches are continuing - Warning that one or more Optional Keys were not supported for existence for this Identifier (no optional key support)	FF01	
Any other status code, not mentioned above.			The issue is logged, the user is notified, and the Association is closed.

7.3.2.1.2 SCP of the Modality Worklist Information Model Find SOP Class - C-FIND

N/A

7.3.2.2 Modality Performed Procedure Step Service

7.3.2.2.1 SCU of the Modality Performed Procedure Step SOP Class - N-CREATE

Table 7.3-4 lists the Status Codes that the SCU of the Modality Performed Procedure Step SOP Class supports for the N-CREATE message and defines the application behavior when encountering the listed Status Codes.

Table 7.3-4 Status Codes for N-CREATE of the Modality Performed Procedure Step SOP Class - SCU

Status Class	Further Meaning	Status Code	Behavior
Success	MPPS creation request processed successfully.	0000	MPPS is created.
Error	MPPS creation request could not be processed.	Any non 0000 code	MPPS is not created.

7.3.2.2.2 SCU of the Modality Performed Procedure Step SOP Class - N-SET

Table 7.3-5 lists the Status Codes that the SCU of the Modality Performed Procedure Step SOP Class supports for the N-SET message and defines the application behavior when encountering the listed Status Codes.

Table 7.3-5 Status Codes for N-SET of the Modality Performed Procedure Step SOP Class - SCU

Status Class	Further Meaning	Status Code	Behavior
Success	MPPS update request was processed successfully.	0000	MPPS is updated.
Error	MPPS update request could not be processed.	Any non 0000 code	MPPS is not updated.

7.3.2.2.3 SCP of the Modality Performed Procedure Step SOP Class - N-CREATE

N/A

7.3.2.2.4 SCP of the Modality Performed Procedure Step SOP Class - N-SET

N/A

7.3.2.3 Unified Worklist und Procedure Step Service

N/A

7.3.2.4 Instance Availability Notification Service

N/A

7.3.2.5 Storage Service

7.3.2.5.1 SCU of the Storage SOP Classes - C-STORE

Table 7.3-6 lists the Status Codes that the SCU of the Storage SOP Class supports for the C-STORE message and defines the application behavior when encountering the listed Status Codes.

Table 7.3-6 Status Codes for C-STORE for the Storage SOP Classes - SCU

Status Class	Further Meaning	Status Code	Behavior
Success	Success	0000	The success is reported.
Warning	Coercion of Data Elements	B000	The issue is logged, and the user gets notified about the Status.
	Data Set does not match SOP Class	B007	
	Elements Discarded	B006	
Failure	Refused: SOP Class not supported	0112	
	Invalid SOP Instance	0117	
	Duplicate Invocation	0210	
	Unrecognized Operation	0211	
	Mistyped Argument	0212	
	Not authorized	0214	
	Out of Resources	A700-A7FF	
	Data Set does not match SOP Class	A900-A9FF	
	Cannot Understand	C000-CFFF	
Any other Status Code not mentioned above			

7.3.2.5.2 SCP of the Storage SOP Classes - C-STORE

Table 7.3-7 lists the Status Codes that the SCP of the Storage SOP Classes supports for the C-STORE message and defines conditions in which the listed Status Codes are sent.

Table 7.3-7 Status Codes C-STORE of the Storage SOP Classes - SCP

Status Class	Further Meaning	Status Codes	Related Fields	Condition (and Comments on Related fields)
Success	Success	0000		The success is reported.
Error	Invalid SOP Instance	0117		This Status Code is sent for every issue by storing and processing the received data.

7.3.2.6 Storage Commitment Service

7.3.2.6.1 SCU of the Storage Commitment Push Model SOP Class - N-ACTION

Table 7.3-8 lists the Status Codes that the SCU of the Storage Commitment Push Model SOP Class supports for the N-ACTION message and defines the application behavior when encountering the listed Status Codes.

Table 7.3-8 Status Codes for N-ACTION of the Storage Commitment Push Model SOP Class - SCU

Status Class	Further Meaning	Status Code	Behavior
Success		0000	The success is reported.
Failure	Processing failure	0110	If any error code is received, Processing failure (0110) is reported. The Instance the error was reported for, will not be considered as completely archived.
	No such SOP Instance	0112	
	No such argument	0114	
	Invalid argument Value	0115	
	Invalid Object Instance	0117	
	No such SOP Class	0118	
	Class-Instance conflict	0119	
	No such action	0123	
	Refused: Not Authorized	0124	
	Duplicate invocation	0210	
	Unrecognized operation	0211	
	Mistyped argument	0212	
	Resource limitation	0213	
Any other status code not mentioned above			

7.3.2.6.2 SCU of the Storage Commitment Push Model SOP Class - N-EVENT-REPORT

A Reverse SCP/SCU Role Selection Negotiation takes place here. The SCU initiating the Storage Commitment will act as an SCP for the N-EVENT-REPORT-RQ message after the N-ACTION-RQ message is sent to the PACS node. So the sender of N-ACTION-RQ acts as an SCP by waiting for the Storage Commitment response in form of an N-EVENT-REPORT-RQ, which will be sent by the PACS in a new Association initiated by the PACS.

Table 7.3-9 lists the Status Codes that the SCU of the Storage Commitment Push Model SOP Class supports for the N-EVENT-REPORT message and defines the application behavior when encountering the listed Status Codes.

Table 7.3-9 Status Codes for N-EVENT-REPORT for the Storage Commitment Push Model SOP Class - SCU

Status Class	Further Meaning	Status Code	Behavior
Success		0000	The success is reported.
Failure	Processing failure	0110	If any error code is received, Processing failure (0110) is reported. The Instance the error was reported for, will not be considered as completely archived by the initiator of the Storage Commitment.
	No such SOP Instance	0112	
	No such argument	0114	
	Invalid argument Value	0115	
	Invalid Object Instance	0117	
	No such SOP Class	0118	
	Class-Instance conflict	0119	
	No such action	0123	
	Refused: Not Authorized	0124	
	Duplicate invocation	0210	
	Unrecognized operation	0211	
	Mistyped argument	0212	
Any other status code not mentioned above			

7.3.2.6.3 SCP of the Storage Commitment Push Model SOP Class - N-ACTION

N/A

7.3.2.6.4 SCP of the Storage Commitment Push Model SOP Class - N-EVENT-REPORT

N/A

7.3.2.7 Query/Retrieve Service

7.3.2.7.1 SCU of the Query/Retrieve - FIND SOP Classes - C-FIND

Table 7.3-10 lists the Status Codes that the SCU of any of the Query/Retrieve FIND SOP Class supports for the C-FIND message and defines the application behavior when encountering the listed Status Codes.

Table 7.3-10 Status Codes C-FIND for Query/Retrieve FIND SOP Classes - SCU

Status Class	Further Meaning	Status Code	Behavior
Success	Matching is complete - No final identifier is supplied	0000	The success is reported, and the Association is closed
Failure	Refused: Out of Resources	A700	The error code is logged and reported to the user.
	Error: Identifier does not match SOP Class	A900	
	Error: Unable to process	C000-CFFF	
	Refused: SOP Class Not Supported	0122	
Cancel	Matching terminated due to cancel	FE00	The Association is closed.
Pending	Matches are continuing - Current Match is supplied and any Optional Keys were supported in the same manner as Required Keys.	FF00	These messages are not forwarded to the user.
	Matches are continuing - Warning that one or more Optional Keys were not supported for existence for this Identifier	FF01	
Any other status code not mentioned above			In case of any other status code received, the error code is logged and reported to the user.

7.3.2.7.2 SCU of the Query/Retrieve MOVE SOP Classes – C-MOVE

Table 7.3-11 lists the Status Codes that the SCU of any of the Query/Retrieve MOVE SOP Class supports for the C-MOVE message and defines the application behavior when encountering the listed Status Codes.

Table 7.3-11 Status Codes C-MOVE for Query/Retrieve MOVE SOP Classes – SCU

Status Class	Further Meaning	Status Codes	Related Fields	Behavior
Success	Sub-operations Complete – No Failures	0000	(0000,1020); (0000,1021); (0000,1022); (0000,1023)	The success is reported.
Warning	Sub-operations Complete – One or more Failures	B000	(0000,1020); (0000,1022); (0000,1023)	The issue is reported to the user and logged.
Failed	Out of Resources – Unable to calculate number of matches	A701	(0000,0902)	The issue is reported to the user and logged. The * stands for any digit.
	Out of Resources – Unable to perform sub-operations	A702	(0000,1020); (0000,1021); (0000,1022); (0000,1023)	
	Move Destination unknown	A801	(0000,0902)	
	Identifier does not match SOP Class	A900	(0000,0901); (0000,0902)	
	Unable to process	C000-CFFF	(0000,0901); (0000,0902)	
Cancel	Sub-operations terminated due to Cancel Indication	FE00	(0000,1020); (0000,1021); (0000,1022); (0000,1023)	The Association is terminated.
Pending	Sub-operations are continuing	FF00	(0000,1020); (0000,1021); (0000,1022); (0000,1023)	No error is reported.
Any other status code not mentioned above				The issue is reported to the user and logged.

7.3.2.7.3 SCP of the Query/Retrieve FIND SOP Classes – C-FIND

Table 7.3-12 lists the Status Codes that the SCP of any of the Query/Retrieve FIND SOP Classes supports for the C-FIND message and defines conditions in which the listed Status Codes are sent.

Table 7.3-12 Status Codes C-FIND for Query/Retrieve FIND SOP Classes – SCP

Status Class	Further Meaning	Status Code	Condition
Success	Matching is complete - No final identifier is supplied	0000	The success answer is sent, and the Association is closed.
Failure	Refused: Out of Resources	A700	
	Error: Identifier does not match SOP Class	A900	
	Error: Unable to process	C000	
	Refused: SOP Class Not Supported	0122	
Cancel	Matching terminated due to cancel	FE00	
Pending	Matches are continuing - Current Match is supplied and any Optional Keys were supported in the same manner as Required Keys.	FF00	
	Matches are continuing - Warning that one or more Optional Keys were not supported for existence for this Identifier	FF01	

Any other non-success Status Code (except for those indicating that the operation is pending) that appears is reported to the SCU and the Association is closed.

7.3.2.7.4 SCP of the Query/Retrieve MOVE SOP Classes - C-MOVE

Table 7.3-13 lists the Status Codes that the SCP of any of the Query/Retrieve MOVE SOP Classes supports for the C-MOVE message and defines conditions in which the listed Status Codes are sent.

Table 7.3-13 Status Codes C-MOVE for Query/Retrieve MOVE SOP Classes - SCP

Status Class	Further Meaning	Status Codes	Related Fields sent in the response	Condition	Action on the Store due the condition.
Success	Sub-operations Complete - No Failures	0000	(0000,1020) (0000,1021) (0000,1022) (0000,1023)	No issue occurred.	The Success Code is sent to the calling SCU.
Warning	Sub-operations Complete - One or more Failures	B000	(0000,1020) (0000,1022) (0000,1023)	If no matches were found	The Status Code is sent to the calling SCU.
Failed	Out of Resources - Unable to calculate number of matches	A701	(0000,0902)	The C-STORE operation failed.	The code is sent to the calling SCU.
	Out of Resources - Unable to perform sub-operations	A702	(0000,1020) (0000,1021) (0000,1022) (0000,1023)	The chunking of the data to be send failed.	The code is sent to the calling SCU.
	Move Destination unknown	A801	(0000,0902)	The initialization of the C-STORE operation failed	The code is sent to the calling SCU.
	Identifier does not match SOP Class	A900	(0000,0901) (0000,0902)	The extraction of the Query information from C-MOVE RQ Data Set failed.	The code is sent to the calling SCU.
	Unable to process	C000	(0000,0901) (0000,0902)	Merging the data chunk failed. Transfer Syntax resolving failed. Resolving Transfer Syntaxes from the Presentation Context failed. The conversion of C-MOVE-RQ stream to Data Set failed. Context folder creation failed. Move Response Sender update failed. Instance check out failed. C-MOVE response sequencing failed.	The Code is sent to the calling SCU.

Status Class	Further Meaning	Status Codes	Related Fields sent in the response	Condition	Action on the Store due the condition.
				Context folder could not be deleted.	
Cancel	Sub-operations terminated due to Cancel Indication	FE00	(0000,1020) (0000,1021) (0000,1022) (0000,1023)		The confirmation is sent to the calling SCU with Status Code CMovePendingMoreSubOperations (FF00)

7.3.2.8 Print Management Service

The Status Codes received in the responses for Print Management related N-CREATE, N-SET and N-DELETE are all handled in the same way. They are forwarded to the user if:

- the Status Code points to a failure or
- the Status Code points to a warning.

Every Status Code received in the response to an N-ACTION message is forwarded to the user.

The DICOM Module does not handle any of the Status Codes.

7.3.2.8.1 SCU of the Basic Film Session SOP Class

SCU of the Basic Film Session SOP Class - N-CREATE

Table 7.3-14 lists the Status Codes that the SCU of the Basic Film Session SOP Class supports for the N-CREATE message and defines the application behavior when encountering the listed Status Codes.

Table 7.3-14 Status Codes for N-CREATE of the Basic Film Session SOP Class - SCU

Status Class	Further Meaning	Status Code	Behavior
Success	Success	0000	The success code received in N-CREATE RSP is neither handled, nor forwarded to the user.
Warning	Attribute List Error	0107	The warnings received in the N-CREATE RSP are neither handled, nor forwarded to the user.
	Attribute Value Out of Range	0116	
	Memory allocation not supported	B600	
Failure	No Such Attribute	0105	In case of any failure occurred, the user is going to be notified.
	Invalid Attribute Value	0106	
	Processing Failure	0110	
	Duplicate SOP Instance	0111	
	Invalid Object Instance	0117	
	No Such SOP Class	0118	
	Missing Attribute	0120	
	Missing Attribute Value	0121	
	Refused: Not Authorized	0124	
	Duplicate Invocation	0210	
	Unrecognized Operation	0211	

Status Class	Further Meaning	Status Code	Behavior
	Mistyped Argument	0212	
	Resource Limitation	0213	
Any other Status Code not mentioned above			

SCU of the Basic Film Session SOP Class - N-SET

Table 7.3-15 lists the Status Codes that the SCU of the Basic Film Session SOP Class supports for the N-SET message and defines the application behavior when encountering the listed Status Codes.

Table 7.3-15 Status Codes for N-SET of the Basic Film Session SOP Class - SCU

Status Class	Further Meaning	Status Code	Behavior
Success	Success	0000	The success is reported.
Warning	Attribute List Error	0107	The issue is reported to the user and logged.
	Attribute Value Out of Range	0116	
	Memory allocation not supported	B600	
Failure	No Such Attribute	0105	
	Invalid Attribute Value	0106	
	Processing Failure	0110	
	Duplicate SOP Instance	0111	
	No such SOP Instance	0112	
	Invalid Object Instance	0117	
	No Such SOP Class	0118	
	Class Instance Conflict	0119	
	Missing Attribute	0120	
	Missing Attribute Value	0121	
	Refused: Not Authorized	0124	
	Duplicate Invocation	0210	
	Unrecognized Operation	0211	
	Mistyped Argument	0212	
	Resource Limitation	0213	
Any other Status Code not mentioned above			

SCU of the Basic Film Session SOP Class - N-DELETE

Table 7.3-16 lists the Status Codes that the SCU of the Basic Film Session SOP Class supports for the N-DELETE message and defines the application behavior when encountering the listed Status Codes.

Table 7.3-16 Status Codes for N-DELETE of the Basic Film Session SOP Class - SCU

Status Class	Further Meaning	Status Code	Behavior
Success	Success	0000	The success is reported.
Failure	Processing Failure	0110	The issue is reported to the user and logged.
	Invalid Object Instance	0117	
	No Such SOP Class	0118	
	Class Instance Conflict	0119	
	Refused: Not Authorized	0124	
	Duplicate Invocation	0210	
	Unrecognized Operation	0211	
	Mistyped Argument	0212	
	Resource Limitation	0213	
Any other Status Code not mentioned above			

SCU of the Basic Film Session SOP Class - N-ACTION

Table 7.3-17 lists the Status Codes that the SCU of the Basic Film Session SOP Class supports for the N-ACTION message and defines the application behavior when encountering the listed Status Codes.

Table 7.3-17 Status Codes for N-Action of the Basic Film Session SOP Class - SCU

Status Class	Further Meaning	Status Code	Behavior
Success	Film belonging to the film session are accepted for printing; if supported, the Print Job SOP Instance is created	0000	The success is reported.
Warning	Film session printing (collation) is not supported	B601	The issue is reported to the user and logged.
	Film Session SOP Instance hierarchy does not contain Image Box SOP Instances (empty page)	B602	
	Image size is larger than image box size, the image has been demagnified.	B604	
	Image size is larger than the Image Box size. The Image has been cropped to fit.	B609	
	Image size or Combined Print Image size is larger than the Image Box size. Image or Combined Print Image has been decimated to fit.	B60A	
Failure	Processing failure	0110	
	No such SOP Instance	0112	
	No Such Argument	0114	
	Invalid Argument Value	0115	
	Invalid Object Instance	0117	
	No Such SOP Class	0118	
	Class-Instance Conflict	0119	
	No Such Action	0123	
	Refused: Not Authorized	0124	
	Duplicate Invocation	0210	
	Unrecognized Operation	0211	
	Mistyped Argument	0212	
	Resource Limitation	0213	
	Failed: Film Session SOP Instance hierarchy does not contain Film Box SOP Instances	C600	
	Failed: Unable to create Print Job SOP Instance; print queue is full	C601	
	Failed: Image size is larger than image box size	C603	
	Failed: Combined Print Image size is larger than the Image Box size	C613	
Any other Status Code not mentioned above			

7.3.2.8.2 SCU of the Basic Box Session SOP Class

SCU of the Basic Box Session SOP Class - N-CREATE

Table 7.3-14 lists the Status Codes that the SCU of the Basic Film Box SOP Class supports for the N-CREATE message and defines the application behavior when encountering the listed Status Codes.

Table 7.3-18 Status Codes for N-CREATE of the Basic Film Box SOP Class - SCU

Status Class	Further Meaning	Status Code	Behavior
Success	Success	0000	The success is reported.
Warning	Attribute List Error	0107	The issue is reported to the user and logged.
	Attribute Value Out of Range	0116	
	Requested Min Density or Max Density outside of printer's operating range	B605	
Failure	No Such Attribute	0105	
	Invalid Attribute Value	0106	
	Processing Failure	0110	
	Duplicate SOP Instance	0111	
	Invalid Object Instance	0117	
	No Such SOP Class	0118	
	Missing Attribute	0120	
	Missing Attribute Value	0121	
	Refused: Not Authorized	0124	
	Duplicate Invocation	0210	
	Unrecognized Operation	0211	
	Mistyped Argument	0212	
	Resource Limitation	0213	
	There is an existing Film Box that has not been printed and N-ACTION at the Film Session level is not supported. A new Film Box will not be created when a previous Film Box has not been printed	C616	
Any other Status Code not mentioned above			

SCU of the Basic Box Session SOP Class - N-SET

Table 7.3-19 lists the Status Codes that the SCU of the Basic Film Box SOP Class supports for the N-SET message and defines the application behavior when encountering the listed Status Codes.

Table 7.3-19 Status Codes for N-SET of the Basic Film Box SOP Class - SCU

Status Class	Further Meaning	Status Code	Behavior
Success	Success	0000	The success is reported.
Warning	Attribute List Error	0107	The issue is reported to the user and logged.
	Attribute Value Out of Range	0116	
	Requested Min Density or Max Density outside of printer's operating range	B605	
Failure	No Such Attribute	0105	
	Invalid Attribute Value	0106	
	Processing Failure	0110	
	Duplicate SOP Instance	0111	
	Invalid Object Instance	0117	
	No Such SOP Class	0118	
	Class Instance Conflict	0119	
	Missing Attribute	0120	
	Missing Attribute Value	0121	
	Refused: Not Authorized	0124	
	Duplicate Invocation	0210	
	Unrecognized Operation	0211	
	Mistyped Argument	0212	
	Resource Limitation	0213	
	There is an existing Film Box that has not been printed and N-ACTION at the Film Session level is not supported. A new Film Box will not be created when a previous Film Box has not been printed	C616	
Any other Status Code not mentioned above			

SCU of the Basic Box Session SOP Class - N-DELETE

Table 7.3-20 lists the Status Codes that the SCU of the Basic Film Box SOP Class supports for the N-DELETE message and defines the application behavior when encountering the listed Status Codes.

Table 7.3-20 Status Codes for N-DELETE of the Basic Film Box SOP Class - SCU

Status class	Further Meaning	Status Code	Behavior
Success	Success	0000	The success is reported.
Failure	Processing Failure	0110	The issue is reported to the user and logged.
	Invalid Object Instance	0117	
	No Such SOP Class	0118	
	Class Instance Conflict	0119	
	Refused: Not Authorized	0124	
	Duplicate Invocation	0210	
	Unrecognized Operation	0211	
	Mistyped Argument	0212	
	Resource Limitation	0213	
Any other Status Code not mentioned above			

SCU of the Basic Box Session SOP Class - N-ACTION

Table 7.3-21 lists the Status Codes that the SCU of the Basic Film Box SOP Class supports for the N-ACTION message and defines the application behavior when encountering the listed Status Codes.

Table 7.3-21 Status Codes for N-ACTION of the Basic Film Box SOP Class - SCU

Status Class	Further Meaning	Status Code	Behavior
Success	Success	0000	The success is reported.
Warning	Film Box SOP Instance hierarchy does not contain Image Box SOP Instances (empty page)	B603	The issue is reported to the user and logged.
	Image size is larger than Image Box size. The image has been demagnified.	B604	
	Image size is larger than Image Box size. The image has been cropped to fit.	B609	
	Image size or Combined Print Image Size is larger than Image Box size. The image or combined Print Image has been decimated to fit.	B60A	
Failure	Processing failure	0110	
	No such SOP Instance	0112	
	No Such Argument	0114	
	Invalid Argument Value	0115	
	Invalid Object Instance	0117	
	No Such SOP Class	0118	
	Class-Instance Conflict	0119	
	No Such Action	0123	
	Refused: Not Authorized	0124	
	Duplicate Invocation	0210	
	Unrecognized Operation	0211	
	Mistyped Argument	0212	
	Resource Limitation	0213	
	Unable to create Print Job SOP Instance; print queue is full.	C602	
	Image size is larger than Image Box size.	C603	
	Combined Print Image Size is larger than Image Box size.	C613	
Any other Status Code not mentioned above			

7.3.2.8.3 SCU of the Basic Grayscale Image Box SOP Class - N-SET

Table 7.3-22 lists the Status Codes that the SCU of the Basic Grayscale Image Box SOP Class supports for the N-SET message and defines the application behavior when encountering the listed Status Codes.

Table 7.3-22 Status Codes for N-SET of the Grayscale Image Box SOP Class - SCU

Status Class	Further Meaning	Status Code	Behavior
Success	Success	0000	The success is reported.
Warning	Image size is larger than Image Box size. The image has been demagnified.	B604	The issue is reported to the user and logged.
	Requested Min Density or Max Density outside of printer's operating range.	B605	
	Image size is larger than Image Box size. The image has been cropped to fit.	B609	
	Image size or Combined Print Image Size is larger than Image Box size. The image or combined Print Image has been decimated to fit.	B60A	
Failure	No Such Attribute	0105	
	Invalid Attribute Value	0106	
	Processing Failure	0110	
	Duplicate SOP Instance	0111	
	Invalid Object Instance	0117	
	No Such SOP Class	0118	
	Class Instance Conflict	0119	
	Missing Attribute	0120	
	Missing Attribute Value	0121	
	Refused: Not Authorized	0124	
	Duplicate Invocation	0210	
	Unrecognized Operation	0211	
	Mistyped Argument	0212	
	Resource Limitation	0213	
	Image size is larger than Image Box size.	C603	
	Insufficient memory in printer to store the image.	C605	
	Combined Print Image Size is larger than Image Box size.	C613	
Any other Status Code not mentioned above			

7.3.2.8.4 SCU of the Basic Color Image Box SOP Class - N-SET

Table 7.3-23 lists the Status Codes that the SCU of the Basic Color Image Box SOP Class supports for the N-SET message and defines the application behavior when encountering the listed Status Codes.

Table 7.3-23 Status Codes for N-SET of the Color Image Box SOP Class - SCU

Status Class	Further Meaning	Status Code	Behavior
Success	Success	0000	The success is reported.
Warning	Image size is larger than Image Box size. The image has been demagnified.	B604	The issue is reported to the user and logged.
	Image size is larger than Image Box size. The image has been cropped to fit.	B609	
	Image size or Combined Print Image Size is larger than Image Box size. The image or combined Print Image has been decimated to fit.	B60A	
Failure	No Such Attribute	0105	
	Invalid Attribute Value	0106	
	Processing Failure	0110	
	Duplicate SOP Instance	0111	
	Invalid Object Instance	0117	
	No Such SOP Class	0118	
	Class Instance Conflict	0119	
	Missing Attribute	0120	
	Missing Attribute Value	0121	
	Refused: Not Authorized	0124	
	Duplicate Invocation	0210	
	Unrecognized Operation	0211	
	Mistyped Argument	0212	
	Resource Limitation	0213	
	Image size is larger than Image Box size.	C603	
	Insufficient memory in printer to store the image.	C605	
	Combined Print Image Size is larger than Image Box size.	C613	
Any other Status Code not mentioned above			

7.3.2.8.5 SCU of the Printer SOP Class

SCU of the Printer SOP Class - N-EVENT-REPORT

Table 7.3-24 lists the Status Codes that the SCU of Printer SOP Class supports for the N-EVENT-REPORT message and defines the application behavior when encountering the listed Status Codes.

Table 7.3-24 Status Codes for N-EVENT-REPORT of the Printer SOP Class - SCU

Status Class	Further Meaning	Status Code	Behavior
Success	Success	0000	The success is reported.
Failure	Processing Failure	0110	The issue is reported to the user and logged.
	No Such SOP Instance	0112	
	No Such Event Type	0113	
	No Such Argument	0114	
	Invalid Argument Value	0115	
	Invalid Object Instance	0117	
	No Such SOP Class	0118	
	Class-Instance Conflict	0119	
	Duplicate Invocation	0210	
	Unrecognized Operation	0211	
	Mistyped Argument	0212	
	Resource Limitation	0213	
Any other Status Code not mentioned above			

SCU of the Printer SOP Class - N-GET

Table 7.3-25 lists the Status Codes that the SCU of the Printer SOP Class supports for the N-GET message and defines the application behavior when encountering the listed Status Codes.

Table 7.3-25 Status Codes for N-GET of the Printer SOP Class - SCU

Status Class	Further Meaning	Status Code	Behavior
Success	Success	0000	The success is reported.
Warning	Attribute List Error	0107	The issue is reported to the user and logged.
Failure	Processing Failure	0110	
	No Such SOP Instance	0112	
	Invalid Object Instance	0117	
	No Such SOP Class	0118	
	Class-Instance Conflict	0119	
	Refused: Not Authorized	0124	
	Duplicate Invocation	0210	
	Unrecognized Operation	0211	
	Mistyped Argument	0212	
	Resource Limitation	0213	
Any other Status Code not mentioned above			

7.3.2.8.6 SCU of the Print Job SOP Class

SCU of the Print Job SOP Class - N-EVENT-REPORT

Table 7.3-26 lists the Status Codes that the SCU of the Print Job SOP Class supports for the N-EVENT-REPORT message and defines the application behavior when encountering the listed Status Codes.

Table 7.3-26 Status Codes N-EVENT-REPORT of the Print Job SOP Class - SCU

Status Class	Further Meaning	Status Code	Behavior
Success	Success	0000	The success is reported.
Failure	Processing Failure	0110	The issue is reported to the user and logged.
	No Such SOP Instance	0112	
	No Such Event Type	0113	
	No Such Argument	0114	
	Invalid Argument Value	0115	
	Invalid Object Instance	0117	
	No Such SOP Class	0118	
	Class-Instance Conflict	0119	
	Duplicate Invocation	0210	
	Unrecognized Operation	0211	
	Mistyped Argument	0212	
	Resource Limitation	0213	
Any other Status Code not mentioned above			

SCU of the Print Job SOP Class - N-GET

Table 7.3-27 lists the Status Codes that the SCU of Print Job SOP Class supports for the N-GET message and defines the application behavior when encountering the listed Status Codes.

Table 7.3-27 Status Codes for N-GET of the Print Job SOP Class - SCU

Status Class	Further Meaning	Status Code	Behavior
Success	Success	0000	The success is reported.
Warning	Attribute List Error	0107	The issue is reported to the user and logged.
Failure	Processing Failure	0110	
	No Such SOP Instance	0112	
	Invalid Object Instance	0117	
	No Such SOP Class	0118	
	Class-Instance Conflict	0119	
	Refused: Not Authorized	0124	
	Duplicate Invocation	0210	
	Unrecognized Operation	0211	
	Mistyped Argument	0212	
	Resource Limitation	0213	
Any other Status Code not mentioned above			

7.3.2.8.7 SCU of the Presentation LUT SOP Class

SCU of the Presentation LUT SOP Class - N-CREATE

Table 7.3-28 lists the Status Codes that the SCU of the Presentation LUT SOP Class supports for the N-CREATE message and defines the application behavior when encountering the listed Status Codes.

Table 7.3-28 Status Codes N-CREATE of the Presentation LUT SOP Class - SCU

Status Class	Further Meaning	Status Code	Behavior
Success	Success	0000	The success is reported.
Warning	Attribute List Error	0107	The issue is reported to the user and logged.
	Attribute Value Out of Range	0116	
	Requested Min Density or Max Density outside of printer's operating range	B605	
Failure	No Such Attribute	0105	
	Invalid Attribute Value	0106	
	Processing Failure	0110	
	Duplicate SOP Instance	0111	
	Invalid Object Instance	0117	
	No Such SOP Class	0118	
	Missing Attribute	0120	
	Missing Attribute Value	0121	
	Refused: Not Authorized	0124	
	Duplicate Invocation	0210	
	Unrecognized Operation	0211	
	Mistyped Argument	0212	
	Resource Limitation	0213	
Any other Status Code not mentioned above			

SCU of the Presentation LUT SOP Class - N-DELETE

Table 7.3-29 lists the Status Codes that the SCU of the Presentation LUT SOP Class supports for the N-DELETE message and defines the application behavior when encountering the listed Status Codes.

Table 7.3-29 Status Codes for N-DELETE of the Presentation LUT SOP Class - SCU

Status class	Further Meaning	Status Code	Behavior
Success	Success	0000	The success is reported.
Failure	Processing Failure	0110	The issue is reported to the user and logged.
	Invalid Object Instance	0117	
	No Such SOP Class	0118	
	Class Instance Conflict	0119	
	Refused: Not Authorized	0124	
	Duplicate Invocation	0210	
	Unrecognized Operation	0211	
	Mistyped Argument	0212	
	Resource Limitation	0213	
Any other Status Code not mentioned above			

7.3.2.8.8 SCP of the Basic Film Session SOP Class

Print SCP is not supported.

7.3.2.8.9 SCP of the Basic Film Box SOP Class

Print SCP is not supported.

7.3.2.8.10 SCP of the Basic Grayscale Image Box SOP Class - N-SET

Print SCP is not supported.

7.3.2.8.11 SCP of the Basic Color Image Box SOP Class - N-SET

Print SCP is not supported.

7.3.2.8.12 SCP of the Printer SOP Class

Print SCP is not supported.

7.3.2.8.13 SCP the Basic Annotation Box SOP Class - N-SET

Print SCP is not supported.

7.3.2.8.14 SCP of the Print Job SOP Class

Print SCP is not supported.

7.3.2.8.15 SCP of the Presentation LUT SOP Class

Print SCP is not supported.

7.3.2.8.16 SCP of the Printer Configuration Retrieval SOP Class - N-GET

Print SCP is not supported.

7.3.3 DICOM Web Services

N/A

8 Security

8.1 Introduction

The Security Section describes security features implemented by this product. It includes description of non-DICOM network protocols, information to configure firewalls and application whitelists, list of supported DICOM security profiles as well as Web Security features. Additionally, secured media storage, VPN, etc. are also specified in this Security Section.

8.2 External Network Requirements

Table 8.2-1 describes additional non-DICOM network protocols that are used by syngo CT.

Table 8.2-1 External Network Requirements

Profile	Actor	Transaction	Protocol Used	RFCs	Security Support	Reference
Basic Time Synchronization						
	NTP Client	Maintain Time	NTP	RFC5905	N	C.1.1
		Find NTP Servers	NTP	RFC5905	N	C.1.1
	SNTP Client	Maintain Time	SNTP	RFC2030	N	C.1.1
	DHCP Client	Find NTP Servers	DHCP	RFC2131; RFC2132; RFC2563	Y	C.1.1
Basic Network Address Management						
	DHCP Client	Find and Use DHCP Server	DHCP	RFC2131; RFC2132; RFC2563	Y	C.1.2
		Maintain Lease	DHCP	RFC2131; RFC2132	Y	C.1.2
	DNS Client	Resolve Hostname	DNS	RFC1035; RFC2181	Y	C.1.2
Application Configuration Management						
	LDAP Client	Find LDAP Server	LDAP	RFC2181; RFC2219; RFC2782	Y	0
		Query LDAP Server	LDAP	RFC2251	Y	0
		Update LDAP Server	LDAP	RFC2251	Y	0
DNS Service Discovery						

Profile	Actor	Transaction	Protocol Used	RFCs	Security Support	Reference
	DNS Client	Find DICOM Service	DNS	RFC2136; RFC2181; RFC2219; RFC2782; RFC6762; RFC6763; RFC8553	Y	C.1.4

Please note, that the supported profiles (DHCP, DNS and LDAP) are all supported using the APIs of the Operating System.

8.3 TCP Port Configuration

See Section 6 Configuration for information on DICOM and other protocol Port usage. This Section contains helpful information for product administrators to configure firewall, application whitelist, etc.

Firewall rules (inbound and outbound) for the standard DICOM ports 104 and 2762 for secure communication are set up automatically on installation. If any other port is used, the rules must be updated accordingly. The port numbers can be changed in the Administration Portal.

8.4 DICOM Security Profiles Support

8.4.1 Secure Use and User Identity Profiles

N/A

8.4.2 Secure Transport Connection Profiles

Table 8.4-1 describes the Secure Transport Connection Profiles supported by the product (version TLS-1.2). Accepted cipher suites are described in the Section listed in the “Reference” column.

Table 8.4-1 Secure Transport Connection Profiles

Profile	Secured AE	Sender	Receiver	Reference
BCP 195 RFC 8996, 9325 TLS Secure Transport Connection Profile	ALL *	Y	Y	C.2.5
Extended BCP195 TLS Secure Transport Connection	NONE	N	N	C.2.5

* The secured communication is configurable for the Local DICOM Remote node and every Remote DICOM Node separately.

Please note, that in case a secure connection is established, the selection of the cipher suite depends on the settings of the Operating System. Since syngo CT is always provided together with the Operating System Microsoft Windows, the selection of the cipher suite happens automatically, based on TLS -1.2used.

8.4.3 Media Storage Security Profiles

N/A

8.4.4 Attribute Confidentiality Profiles

De-Identification, as specified in the DICOM Standard, is not supported by syngo CT. As an alternative syngo CT provides a Data Minimization feature, which can only be used in Media Export operations.

Data Minimization (see Chapter 8.8) has three profiles: High Privacy, Reduced Privacy and Low Privacy.

Attributes, that are not mentioned in the configuration for the Data Minimization profiles (explicitly or using a wild card-type matching) will be ignored.

See Section C.2.6 for implementation details.

8.4.5 Digital Signature Profiles

N/A

8.4.6 Additional DICOM Security Profiles

N/A

8.5 User Identity Negotiation Support

N/A

8.6 Web Services Security Features

N/A

8.7 Other Security Features

N/A

8.8 Data Minimization

syngo CT application can minimize the data exported to Media. Three different levels of Data Minimization are supported:

- High Privacy
- Reduced Privacy
- Low Privacy

The user needs to select the appropriate Data Minimization level during export.

Handling public attributes during Data Minimization:

- Attributes listed in Table 8.8-1 will be affected by the Data Minimization as specified for the different levels. Attributes not listed in the table are not PII / PHI relevant and will not be affected by the Data Minimization. The list of the Attributes affected by the above-mentioned Profiles can be modified in runtime by the Service Technician. Attributes can be identified explicitly using the full Tag Number or using a wild card-type pattern.

Handling private attributes during Data Minimization:

- Hight Privacy: private attributes are not included.
- Reduced Privacy: private attributes are not included except for the Attributes excluded from the Data Minimization (see Table 8.8-2). Attributes excluded from the Data Minimization will appear in the resulting Data Set.
- Low Privacy: all private attributes are included except for the Attributes, which are meant to be excluded by configuration (see Table 8.8-2).

Table 8.8-1 Data Minimization Profiles

Tag	Attribute Name	High Privacy	Reduced Privacy	Low Privacy
(0004,1511)	Referenced SOP Instance UID in File	Y	Y	N

Tag	Attribute Name	High Privacy	Reduced Privacy	Low Privacy
(0008,0014)	Instance Creator UID	Y	Y	N
(0008,0015)	Instance Coercion DateTime	Y	N	N
(0008,0018)	SOP Instance UID	Y	Y	N
(0008,0020)	Study Date	Y	N	N
(0008,0021)	Series Date	Y	N	N
(0008,0022)	Acquisition Date	Y	N	N
(0008,0023)	Content Date	Y	N	N
(0008,0024)	Overlay Date (Retired)	Y	N	N
(0008,0025)	Curve Date (Retired)	Y	N	N
(0008,002A)	Acquisition DateTime	Y	N	N
(0008,0030)	Study Time	Y	N	N
(0008,0031)	Series Time	Y	N	N
(0008,0032)	Acquisition Time	Y	N	N
(0008,0033)	Content Time	Y	N	N
(0008,0034)	Overlay Time (Retired)	Y	N	N
(0008,0035)	Curve Time (Retired)	Y	N	N
(0008,0050)	Accession Number	Y	Y	N
(0008,0054)	Retrieve AE Title	Y	Y	N
(0008,0055)	Station AE Title	Y	Y	N
(0008,0080)	Institution Name	Y	Y	Y
(0008,0081)	Institution Address	Y	Y	Y
(0008,0082)	Institution Code Sequence	Y	Y	N
(0008,0090)	Referring Physician's Name	Y	Y	Y
(0008,0096)	Referring Physician's Identification Sequence	Y	Y	N
(0008,010D)	Context Group Extension Creator UID	Y	Y	N
(0008,0201)	Time zone Offset From UTC	Y	N	N
(0008,1000)	Network ID (Retired)	Y	Y	N
(0008,1010)	Station Name	Y	Y	Y
(0008,1030)	Study Description	Y	Y	N
(0008,103E)	Series Description	Y	Y	N
(0008,1040)	Institutional Department Name	Y	Y	Y
(0008,1048)	Physician(s) of Record	Y	Y	Y
(0008,1049)	Physician(s) of Record Identification Sequence	Y	Y	N
(0008,1050)	Performing Physicians' Name	Y	Y	Y
(0008,1052)	Performing Physicians' Identification Sequence	Y	Y	N
(0008,1060)	Name of Physician(s) Reading Study	Y	Y	Y
(0008,1062)	Physician Reading Study Identification Sequence	Y	Y	N
(0008,1070)	Operators' Name	Y	Y	Y
(0008,1072)	Operators' Identification Sequence	Y	Y	N

Tag	Attribute Name	High Privacy	Reduced Privacy	Low Privacy
(0008,1080)	Admitting Diagnoses Description	Y	Y	N
(0008,1084)	Admitting Diagnoses Code Sequence	Y	Y	N
(0008,1110)	Referenced Study Sequence	Y	N	N
(0008,1111)	Referenced Performed Procedure Step Sequence	Y	N	N
(0008,1120)	Referenced Patient Sequence	Y	Y	N
(0008,1140)	Referenced Image Sequence	Y	N	N
(0008,1155)	Referenced SOP Instance UID	Y	Y	N
(0008,1195)	Transaction UID	Y	Y	N
(0008,2111)	Derivation Description	Y	N	N
(0008,2112)	Source Image Sequence	Y	N	N
(0008,3010)	Irradiation Event UID	Y	Y	N
(0008,4000)	Identifying Comments (Retired)	Y	Y	N
(0008,9123)	Creator Version UID	Y	Y	N
(0010,0010)	Patient's Name	Y	Y	Y
(0010,0020)	Patient ID	Y	Y	Y
(0010,0021)	Issuer of Patient ID	Y	Y	N
(0010,0030)	Patient's Birth Date	Y	Y	Y
(0010,0032)	Patient's Birth Time	Y	Y	N
(0010,0040)	Patient's Sex	Y	N	N
(0010,0050)	Patient's Insurance Plan Code Sequence	Y	Y	Y
(0010,0101)	Patient's Primary Language Code Sequence	Y	Y	Y
(0010,0102)	Patient's Primary Language Modifier Code Sequence	Y	Y	Y
(0010,1000)	Other Patient IDs (Retired)	Y	Y	Y
(0010,1001)	Other Patient Names	Y	Y	Y
(0010,1002)	Other Patient IDs Sequence	Y	Y	Y
(0010,1005)	Patient's Birth Name	Y	Y	Y
(0010,1010)	Patient's Age	Y	N	N
(0010,1020)	Patient's Size	Y	N	N
(0010,1030)	Patient's Weight	Y	N	N
(0010,1040)	Patient Address	Y	Y	Y
(0010,1050)	Insurance Plan Identification (Retired)	Y	Y	N
(0010,1060)	Patient's Mother's Birth Name	Y	Y	Y
(0010,1080)	Military Rank	Y	Y	N
(0010,1081)	Branch of Service	Y	Y	N
(0010,1090)	Medical Record Locator (Retired)	Y	Y	N
(0010,1100)	Referenced Patient Photo Sequence	Y	Y	N
(0010,2000)	Medical Alerts	Y	Y	N
(0010,2110)	Allergies	Y	Y	N
(0010,2150)	Country of Residence	Y	Y	N

Tag	Attribute Name	High Privacy	Reduced Privacy	Low Privacy
(0010,2152)	Region of Residence	Y	Y	N
(0010,2154)	Patient's Telephone Number	Y	Y	Y
(0010,2160)	Ethnic Group	Y	N	N
(0010,2180)	Occupation	Y	Y	N
(0010,21A0)	Smoking Status	Y	N	N
(0010,21B0)	Additional Patient's History	Y	Y	Y
(0010,21C0)	Pregnancy Status	Y	N	N
(0010,21D0)	Last Menstrual Date	Y	N	N
(0010,21F0)	Patient's Religious Preference	Y	Y	N
(0010,2203)	Patient Sex Neutered	Y	N	N
(0010,2297)	Responsible Person	Y	Y	N
(0010,2299)	Responsible Organization	Y	Y	N
(0010,4000)	Patient Comments	Y	Y	Y
(0018,0010)	Contrast Bolus Agent	Y	Y	N
(0018,1000)	Device Serial Number	Y	Y	N
(0018,1002)	Device UID	Y	Y	N
(0018,1004)	Plate ID	Y	Y	N
(0018,1005)	Generator ID	Y	Y	N
(0018,1007)	Cassette ID	Y	Y	N
(0018,1008)	Gantry ID	Y	Y	N
(0018,1030)	Protocol Name	Y	Y	N
(0018,1400)	Acquisition Device Processing Description	Y	Y	N
(0018,2042)	Target UID	Y	Y	N
(0018,700A)	Detector ID	Y	Y	N
(0018,9424)	Acquisition Protocol Description	Y	Y	N
(0018,9516)	Start Acquisition DateTime	Y	N	N
(0018,9517)	End Acquisition DateTime	Y	N	N
(0018,A003)	Contribution Description	Y	Y	Y
(0020,000D)	Study Instance UID	Y	Y	N
(0020,000E)	Series Instance UID	Y	Y	N
(0020,0010)	Study ID	Y	Y	N
(0020,0052)	Frame of Reference UID	Y	Y	N
(0020,0200)	Synchronization Frame of Reference UID	Y	Y	N
(0020,4000)	Image Comments	Y	Y	N
(0020,9158)	Frame Comments	Y	Y	N
(0020,9161)	Concatenation UID	Y	Y	N
(0020,9164)	Dimension Organization UID	Y	N	N
(0028,1199)	Palette Color Lookup Table UID	Y	Y	N
(0032,1060)	Requested Procedure Description	Y	Y	N

Tag	Attribute Name	High Privacy	Reduced Privacy	Low Privacy
(0038,0004)	Referenced Patient Alias Sequence (Retired)	Y	Y	N
(0038,0010)	Admission ID	Y	Y	N
(0038,0011)	Issuer of Admission ID (Retired)	Y	Y	N
(0038,0060)	Service Episode ID	Y	Y	N
(0038,0061)	Issuer of Service Episode ID (Retired)	Y	Y	N
(0038,0062)	Service Episode Description	Y	Y	N
(0040,0007)	Scheduled Procedure Step Description	Y	Y	N
(0040,0244)	Performed Procedure Step Start Date	Y	N	N
(0040,0245)	Performed Procedure Step Start Time	Y	N	N
(0040,0250)	Performed Procedure Step End Date	Y	N	N
(0040,0251)	Performed Procedure Step End Time	Y	N	N
(0040,0253)	Performed Procedure Step ID	Y	Y	N
(0040,0254)	Performed Procedure Step Description	Y	Y	N
(0040,0275)	Request Attributes Sequence	Y	Y	N
(0040,0280)	Comments on Performed Procedure Step	Y	Y	N
(0040,0555)	Acquisition Context Sequence	Y	Y	N
(0040,1101)	Person Identification Code Sequence	Y	Y	N
(0040,1102)	Person Address	Y	Y	N
(0040,1103)	Person Telephone Numbers	Y	Y	N
(0040,2016)	Placer Order Number of Imaging Service Request	Y	Y	N
(0040,2017)	Filler Order Number of Imaging Service Request	Y	Y	N
(0040,A027)	Verifying Organization	Y	Y	N
(0040,A073)	Verifying Observer Sequence	Y	Y	N
(0040,A075)	Verifying Observer Name	Y	Y	N
(0040,A078)	Author Observer Sequence	Y	Y	N
(0040,A07A)	Participant Sequence	Y	Y	N
(0040,A07C)	Custodial Organization Sequence	Y	Y	N
(0040,A088)	Verifying Observer Identification Code Sequence	Y	Y	N
(0040,A123)	Person Name	Y	Y	N
(0040,A124)	UID	Y	Y	N
(0040,A171)	Observation UID	Y	Y	N
(0040,A730)	Content Sequence	Y	Y	N
(0070,0001)	Graphic Annotation Sequence	Y	Y	N
(0070,0084)	Content Creator's Name	Y	Y	N
(0070,0086)	Content Creator's Identification Code Sequence	Y	Y	N
(0070,031A)	Fiducial UID	Y	Y	N
(0072,005E)	Selector AE Value	Y	Y	N
(0088,0140)	Storage Media Fileset UID	Y	Y	N
(0088,0200)	Icon Image Sequence	Y	Y	N

Tag	Attribute Name	High Privacy	Reduced Privacy	Low Privacy
(0400,0100)	Digital Signature UID	Y	Y	N
(0400,0402)	Referenced Digital Signature Sequence	Y	Y	N
(0400,0403)	Referenced SOP Instance MAC Sequence	Y	Y	N
(0400,0404)	MAC	Y	Y	N
(0400,0561)	Original Attributes Sequence	Y	Y	Y
(2100,0140)	Destination AE	Y	Y	N
(3006,00C2)	Related Frame of Reference UID	Y	N	N
(3008,0105)	Source Serial Number	Y	N	N
(300A,0013)	Dose Reference UID	Y	N	N
(300E,0008)	Reviewer Name	Y	Y	N
(50**,****)	Curve Data	Y	Y	N
(60**,0100)	Overlay Bits Allocated	Y	Y	N
(60**,0102)	Overlay Bit Position	Y	Y	N
(60**,3000)	Overlay Data	Y	Y	N
(60**,4000)	Overlay Comments	Y	Y	N
(FFFA,FFFA)	Digital Signatures Sequence	Y	Y	Y
(FFFC,FFFC)	Data Set Trailing Padding	Y	Y	Y

The * stands for any digit.

Table 8.8-2 Removal of the Private DICOM Attributes in the Data Minimization Process

Tag	Attribute Name	High Privacy	Reduced Privacy	Low Privacy
(0019, SIEMENS CT EXAM APP SHARED, 05)	Multiphase UID	Yes	Yes	Yes
(0019, SIEMENS CT VA0 COAD, 90)	Osteo offset	Yes	No	No
(0019, SIEMENS CT VA0 COAD, 92)	Osteo Regression Line Slope	Yes	No	No
(0019, SIEMENS CT VA0 COAD, 93)	Osteo Regression Line Intercept	Yes	No	No
(0019, SIEMENS CT VA0 COAD, 96)	Osteo Phantom Number	Yes	No	No
(0019, SIEMENS MED NM, 93)	Phase start time	Yes	No	No
(0019, SIEMENS MED NM, A1)	Number of Phases	Yes	No	No
(0019, SIEMENS MED NM, A5)	Number of repeats / phase	Yes	No	No
(0019, SIEMENS MED NM, A6)	Cycles Per Repeat	Yes	No	No
(0019, SIEMENS MED NM, A7)	Repeat Start time	Yes	No	No
(0019, SIEMENS MED NM, A8)	Repeat Stop time	Yes	No	No
(0019, SIEMENS MED NM, A9)	Effective Repeat Time	Yes	No	No
(0019, SIEMENS MED NM, AA)	Acquired Cycles Per Repeat	Yes	No	No
(0033, SIEMENS MED NM, 29)	Crystal Thickness	Yes	No	No
(0033, SIEMENS MED NM, 30)	Preset Name Used for Acquisition	Yes	No	No
(0033, SIEMENS MED NM, 38)	Pixel Scale factor	Yes	No	No
(0035, SIEMENS MED NM, 00)	Specialized TOMO Type	Yes	No	No
(0035, SIEMENS MED NM, 04)	Repeat ID	Yes	No	No
(0035, SIEMENS MED NM, 05)	Phase ID	Yes	No	No
(0041, SIEMENS MED NM, 01)	WholeBody Tomo Position Index	Yes	No	No
(0041, SIEMENS MED NM, 02)	WholeBody Tomo Number of Positions	Yes	No	No
(0041, SIEMENS MED NM, 10)	Effective Emission Energy	Yes	No	No
(0057, SIEMENS MED NM, 03)	NM Pixel Units	Yes	No	No
(0061, SIEMENS MED NM, 62)	Recon Output Type	Yes	No	No
(0061, SIEMENS MED NM, 70)	NM Reconstruction Algorithm	Yes	No	No
(0061, SIEMENS MED NM, 8D)	QSPECT Flag	Yes	No	No
(0065, SIEMENS MED NM, 01)	Original Detector Index	Yes	No	No
(0065, SIEMENS MED NM, 02)	Siemens Planar Data Organization	Yes	No	No
(7FE3, SIEMENS MED NM, 14)	Minimum pixel value in frame	Yes	No	No
(7FE3, SIEMENS MED NM, 15)	Maximum pixel value in frame	Yes	No	No
(7FE3, SIEMENS MED NM, 29)	Number of Rwaves in a frame	Yes	No	No
(0021, SIEMENS MR SDS 01, 19)	MR Phoenix Protocol	Yes	No	No
(0029, SIEMENS CT EXAM IMAGE,49)	Metal Artifact Reduction Type	Yes	No	No
(0029, SIEMENS CSA ENVELOPE, 10)	Syngo Report Data	Yes	No	No
(0029, SIEMENS CSA ENVELOPE, 11)	Syngo Report Presentation	Yes	No	No

Tag	Attribute Name	High Privacy	Reduced Privacy	Low Privacy
(0029, SIEMENS CSA HEADER, 08)	Modality Image Header Type	Yes	No	No
(0029, SIEMENS CSA HEADER, 09)	Modality Image Header Version	Yes	No	No
(0029, SIEMENS CSA HEADER, 10)	Modality Image Header Info	Yes	No	No
(0029, SIEMENS CSA HEADER, 18)	Modality Series Header Type	Yes	No	No
(0029, SIEMENS CSA HEADER, 19)	Modality Series Header Version	Yes	No	No
(0029, SIEMENS CSA HEADER, 20)	Modality Series Header Info	Yes	No	No
(0029, SIEMENS MEDCOM HEADER, 40)	Application Header Sequence	Yes	No	No
(0029, SIEMENS MEDCOM HEADER, 41)	Application Header Type	Yes	No	No
(0029, SIEMENS MEDCOM HEADER, 42)	Application Header ID	Yes	No	No
(0029, SIEMENS MEDCOM HEADER, 43)	Application Header Version	Yes	No	No
(0029, SIEMENS MEDCOM HEADER, 44)	Application Header Info	Yes	No	No
(0029, SIEMENS CT APPL DATASET, 00)	Dual Energy Algorithm Parameters	Yes	No	No
(0029, SIEMENS CT APPL ALG PARAMS, 20)	Perfusion Result Set Id	Yes	No	No
(0029, SIEMENS CSA REPORT, 08)	*syngo* Report Type	Yes	No	No
(0029, SIEMENS CSA REPORT, 09)	*syngo* Report Version	Yes	No	No
(0029, SIEMENS CSA REPORT, 15)	SR Variant	Yes	No	No
(0029, SIEMENS CSA REPORT, 17)	SC SOP Instance UID	Yes	No	No
(0043, GEMS_PARM_01, 1E)	GE Delta Start Time	Yes	No	No
(0049, SIEMENS CT SPP HEADER, 10)	Raw Data Container	Yes	No	No
(0067, SIEMENS MED MI, 02)	Scanner Console Generation	Yes	No	No
(0067, SIEMENS MED MI, 03)	Recon Parameters	Yes	No	No
(0067, SIEMENS MED MI, 05)	Device IVK	Yes	No	No
(0067, SIEMENS MED MI, 14)	Raw Data Description	Yes	No	No
(0067, SIEMENS MED MI, 16)	Raw Data Series Instance UIDs	Yes	No	No
(0067, SIEMENS MED MI, 17)	Raw Data Referenced Series Instance UIDs	Yes	No	No
(0067, SIEMENS MED MI, 18)	Raw Data Blob Sequence	Yes	No	No
(0071, SIEMENS MED PT, 22)	Decay Correction DateTime	Yes	No	No
(0071, SIEMENS MED PT, 23)	Registration Matrix	Yes	No	No
(0071, SIEMENS MED PT, 24)	Table Motion	Yes	No	No
(0071, SIEMENS MED PT, 25)	Lumped Constant	Yes	No	No
(0071, SIEMENS MED PT, 26)	Histogramming Method	Yes	No	No

Tag	Attribute Name	High Privacy	Reduced Privacy	Low Privacy
(0071, SIEMENS MED PT MU MAP, 01)	SOP Class of Source	Yes	No	No
(0071, SIEMENS MED PT MU MAP, 02)	Related Mu Map Series	Yes	No	No

For CT Raw Data the following list of DICOM tags are treated additionally to Table 8.8-1

Table 8.8-3 Removal of specific Raw Data DICOM Attributes in the Data Minimization Process

DICOM Tag	Attribute Name	High Privacy	Reduced Privacy	Low Privacy	Value
(0008,0050)	Accession Number	Yes	Yes	No	Empty
(0008,0090)	Referring Physician's Name	Yes	Yes	Yes	Empty
(0008,103E)	Series Description	Yes	Yes	Yes	N/A
(0008,1090)	Manufacturer's Model Name	Yes	No	Yes	N/A
(0010,0010)	Patient's Name	Yes	Yes	Yes	Dummy name
(0010,0030)	Patient's Birth Date	Yes	Yes	Yes	Current date
(0010,0040)	Patient's Sex	Yes	No	No	O
(0018,1200)	Date of Last Calibration	Yes	Yes	Yes	N/A
(0018,1201)	Time of Last Calibration	Yes	Yes	Yes	N/A
(0020,0010)	Study ID	Yes	Yes	Yes	Empty
(0020,000D)	Study Instance UID	Yes	No	No	New ID
(0020,000E)	Series Instance UID	Yes	No	No	New ID

Annex A Information Object Definitions (IODs)

This Section provides the detailed content for all the SOP Instances natively created by syngo CT (all SOP Classes that are marked in the "Created" column in Table 1.1-1). Details on Attribute coercion are defined in Section 5.2.5.3.

Throughout the tables listed in Annex A the following values are used for the "Source" and "Presence" columns.

In the "Source" column, the following values can be used:

- FIXED: The value is pre-defined and cannot be modified.
- GENERATED: The value is generated by the system.
- CONFIGURATION: The value is copied from system configuration.
- MWL: The value is copied from Modality Worklist entry.
- QUERY: The value is determined by performing a query of any of the supported Query/Retrieve Services.
- USER: The value is entered by the user.
- SCANNED: The value is read from a barcode scanner or similar device.
- EMPTY: The Attribute is sent without value.
- SRC_INSTANCE: The value is copied from previously created/received SOP Instances.

The "Presence" columns reflect the usage of the Module, Functional Group Macro, Attributes, or value in the syngo CT Implementation and is not necessarily the same as defined in the DICOM Standard. For the "Presence" column the following values can be used:

- ALWAYS: The Module, Functional Group Macro, Attribute or value is always present.
- CONDITIONAL: The presence of the Module, Functional Group Macro, Attributes or value is dependent on a condition. The condition must be listed in the "Conditions" column.
- SRC_COPY: The presence of the Attributes and values depends on the availability of these in the source Instances, which are used for copying this information.
- EMPTY: The Attribute is present but without a value (zero length).

The following combinations of Source and Presence of Value are mentioned in general terms in this document; specific conditions are explicitly stated where applicable:

- USER + CONDITIONAL: Value is set only in case user has entered the value (optional attributes)
- MWL + CONDITIONAL: Value is set only in case attribute is provided by MWL

If multiple sources are listed—such as MWL, USER, and GENERATED—this can be interpreted as follows: if the attribute is not provided by MWL, the user can manually set it, or the system will generate a system-specific value.

A.1 Information shared across multiple IODs

A.1.1 Common Modules

All SOP Instances generated by the system use the common Modules listed in Table A.1.1-1 to Table A.1.1-12 or a subset of them, as defined in the IOD-specific subsections below.

Table A.1.1-1 Patient Module Attributes

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Patient´s Name	(0010,0010)	MWL; USER; GENERATED	ALWAYS	ALWAYS			See [1]
Patient ID	(0010,0020)	MWL; USER; GENERATED	ALWAYS	ALWAYS			See [1]
Issuer of Patient ID	(0010,0021)	MWL	CONDITIONAL	ALWAYS		In case it is provided by MWL	
Patient´s Birth Date	(0010,0030)	MWL; USER; GENERATED	ALWAYS	ALWAYS			In case user sets (0010,1010) see [1]
Patient´s Sex	(0010,0040)	MWL; USER; GENERATED	ALWAYS	ALWAYS	Male; Female;Other		"Other" in case of emergency patient
Patient´s Birth Time	(0010,0032)	MWL	CONDITIONAL	ALWAYS		In case it is provided by MWL	
Referenced Patient Sequence	(0008,1120)	MWL	CONDITIONAL	ALWAYS		In case it is provided by MWL	
> Referenced SOP Class UID	(0008,1150)	GENERATED	ALWAYS	ALWAYS	1.2.840.10008.3.1.2.3.3		
> Referenced SOP Instance UID	(0008,1155)	GENERATED	ALWAYS	ALWAYS	1.3.12.2.1107.5.1.7. *+ serial number + part created per SOP Instance*		
Other Patient IDs	(0010,1000)	MWL; USER	CONDITIONAL	ALWAYS		In case provided by MWL or entered by the user	
Other Patient Names	(0010,1001)	MWL; USER	CONDITIONAL	ALWAYS		In case provided by MWL or entered by the user	

Table A.1.1-2 General Study Module Attributes

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Study Instance UID	(0020,000D)	MWL; GENERATED	ALWAYS	ALWAYS			
Study Date	(0008,0020)	MWL; GENERATED	ALWAYS	ALWAYS			
Study Time	(0008,0030)	MWL; GENERATED	ALWAYS	ALWAYS			
Referring Physician's Name	(0008,0090)	MWL	ALWAYS	CONDITIONAL		In case it is provided by MWL	
Study ID	(0020,0010)	MWL; GENERATED	ALWAYS	ALWAYS			
Accession Number	(0008,0050)	MWL; USER; GENERATED	ALWAYS	CONDITIONAL		.Not present for topograms	Generated for emergency patient
Study Description	(0008,1030)	MWL, GENERATED	ALWAYS	ALWAYS			
Referenced Study Sequence	(0008,1110)	GENERATED	ALWAYS	ALWAYS			
> Referenced SOP Class UID	(0008,1150)	GENERATED	ALWAYS	ALWAYS	1.2.840.10008.3.1.2.3.3		
> Referenced SOP Instance UID	(0008,1155)	GENERATED	ALWAYS	ALWAYS	1.3.12.2.1107.5.1.7. *+ serial number + part created per SOP Instance*		
Procedure Code Sequence	(0008,1032)	MWL	CONDITIONAL	ALWAYS		In case it is provided by MWL	
> Code Value	(0008,0100)	FIXED	ALWAYS	ALWAYS			
> Coding Scheme Designator	(0008,0102)	FIXED	ALWAYS	ALWAYS			

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
> Code Meaning	(0008,0104)	FIXED	ALWAYS	ALWAYS			

Table A.1.1-3 Patient Study Module Attributes

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Admitting Diagnoses Description	(0008,1080)	MWL; GENERATED	CONDITIONAL	ALWAYS		In case it is provided by MWL	
Patient's Age	(0010,1010)	MWL; USER; GENERATED	ALWAYS	ALWAYS			Generated in case user sets (0010,0030)
Patient's Size	(0010,1020)	MWL; USER	CONDITIONAL	ALWAYS		In case it is provided by MWL	
Patient`s Weight	(0010,1030)	MWL; USER	CONDITIONAL	ALWAYS		In case it is provided by MWL	
Medical Alerts	(0010,2000)	MWL; USER	CONDITIONAL	ALWAYS		In case it is provided by MWL	
Allergies	(0010,2110)	MWL; USER	CONDITIONAL	ALWAYS		In case it is provided by MWL	
Smoking Status	(0010,21A0)	MWL	CONDITIONAL	ALWAYS		In case it is provided by MWL	
Additional Patient History	(0010,21B0)	MWL	CONDITIONAL	ALWAYS		In case it is provided by MWL	
Pregnancy Status	(0010,21C0)	MWL; USER	CONDITIONAL	ALWAYS		In case it is provided by MWL	
Last Menstrual Date	(0010,21D0)	MWL	CONDITIONAL	ALWAYS		In case it is provided by MWL	

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Occupation	(0010,2180)	MWL	CONDITIONAL	ALWAYS		In case it is provided by MWL	
Admission ID	(0038,0010)	MWL; USER; GENERATED	CONDITIONAL	ALWAYS		In case it is provided by MWL	

Table A.1.1-4 General Equipment Module Attributes

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Manufacturer	(0008,0070)	FIXED	ALWAYS	ALWAYS	Siemens Healthineers		
Institution Name	(0008,0080)	CONFIGURATION	ALWAYS	ALWAYS	*from WS Configuration*		
Institution Address	(0008,0081)	CONFIGURATION	ALWAYS	ALWAYS	*from WS Configuration*		
Station Name	(0008,1010)	CONFIGURATION	ALWAYS	ALWAYS	*from WS Configuration*		
Institutional Department Name	(0008,1040)	CONFIGURATION	ALWAYS	ALWAYS	*from WS Configuration*		
Manufacturer's Model Name	(0008,1090)	FIXED	ALWAYS	ALWAYS	SOMATOM X.cite; SOMATOM X.ceed; syngo_Application_SW_SYS		Value depends on the used product
Device Serial Number	(0018,1000)	FIXED	ALWAYS	ALWAYS			
Software Versions	(0018,1020)	FIXED	ALWAYS	ALWAYS	syngo CT VB20A		
Spatial Resolution	(0018,1050)	FIXED	CONDITIONAL	ALWAYS		Not present for topograms	
Date of Last Calibration	(0018,1200)	GENERATED	ALWAYS	ALWAYS			
Time of Last Calibration	(0018,1201)	GENERATED	ALWAYS	ALWAYS			

Table A.1.1-5 General Acquisition Module Attributes

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Acquisition Number	(0020,0012)	GENERATED	ALWAYS	ALWAYS			
Acquisition Date	(0008,0022)	GENERATED	ALWAYS	ALWAYS			
Acquisition Time	(0008,0032)	GENERATED	ALWAYS	ALWAYS			
Acquisition DateTime	(0008,002A)	GENERATED	ALWAYS	ALWAYS			
Irradiation Event UID	(0008,3010)	GENERATED	ALWAYS	ALWAYS			

Table A.1.1-6 Frame of Reference Module Attributes

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Frame of Reference UID	(0020,0052)	SRC_INSTANCE; GENERATED	ALWAYS	ALWAYS			
Position Reference Indicator	(0020,1040)	SRC_INSTANCE; GENERATED	ALWAYS	EMPTY			

Table A.1.1-7 General Image Module Attributes

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Instance Number	(0020,0013)	GENERATED	ALWAYS	ALWAYS	*Number of image inside a series*		

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Patient Orientation	(0020,0020)	GENERATED	CONDITIONAL	ALWAYS		Only present for ECG images and black images	
Content Date	(0008,0023)	GENERATED	ALWAYS	ALWAYS			
Content Time	(0008,0033)	GENERATED	ALWAYS	ALWAYS			

Table A.1.1-8 Enhanced General Equipment Module Attributes

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Manufacturer	(0008,0070)	FIXED	ALWAYS	ALWAYS	Siemens Healthineers		
Manufacturer's Model Name	(0008,1090)	FIXED	ALWAYS	ALWAYS	SOMATOM X.cite; SOMATOM X.ceed; syngo_Application_SW_SYS		Value depends on the used product
Device Serial Number	(0018,1000)	FIXED	ALWAYS	ALWAYS			
Software Versions	(0018,1020)	FIXED	ALWAYS	ALWAYS	syngo CT VB20A		

Table A.1.1-9 SR Document Series Module Attributes

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Modality	(0008,0060)	FIXED	ALWAYS	ALWAYS	SR		
Series Instance UID	(0020,000E)	GENERATED	ALWAYS	ALWAYS	1.3.12.2.1107.5.1.7. *+ serial number + part created per Series Instance*		
Series Number	(0020,0011)	GENERATED	ALWAYS	ALWAYS			
Series Date	(0008,0021)	GENERATED	ALWAYS	ALWAYS			
Series Time	(0008,0031)	GENERATED	ALWAYS	ALWAYS			
Protocol Name	(0008,1030)	GENERATED	ALWAYS	ALWAYS			
Series Description	(0008,103E)	GENERATED	ALWAYS	ALWAYS			
Referenced Performed Procedure Step Sequence	(0008,1111)	MWL	CONDITIONAL	ALWAYS		In case it is provided by MWL	
> Referenced SOP Class UID	(0008,1150)	GENERATED	ALWAYS	ALWAYS	1.2.840.10008.3.1.2.3.3		
> Referenced SOP Instance UID	(0008,1155)	GENERATED	ALWAYS	ALWAYS	1.3.12.2.1107.5.1.7. *+ serial number + part*		

Table A.1.1-10 SR Document General Module Attribute

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Instance Number	(0020,0013)	FIXED	ALWAYS	ALWAYS	*Number of image inside a series*		
Completion Flag	(0040,A491)	FIXED	ALWAYS	ALWAYS	COMPLETE		

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Verification Flag	(0040,A493)	FIXED	ALWAYS	ALWAYS	UNVERIFIED		
Content Date	(0008,0023)	GENERATED	ALWAYS	ALWAYS			
Content Time	(0008,0033)	GENERATED	ALWAYS	ALWAYS			
Identical Document Sequence	(0040,A525)	GENERATED	CONDITIONAL	ALWAYS		Only in case of Multi-Study	
> Referenced Series Sequence	(0008,1115)	GENERATED	ALWAYS	ALWAYS			
>> Referenced SOP Sequence	(0008,1199)	GENERATED	ALWAYS	ALWAYS			
>>> Referenced SOP Class UID	(0008,1150)	GENERATED	ALWAYS	ALWAYS	1.2.840.10008.3.1.2.3.3		
>>> Referenced SOP Instance UID	(0008,1155)	GENERATED	ALWAYS	ALWAYS	1.3.12.2.1107.5.1.7. *+ serial number + part created per SOP Instance*		
>> Series Instance UID	(0020,000D)	GENERATED	ALWAYS	ALWAYS			
Referenced Request Sequence	(0040,A370)	MWL; GENERATED	CONDITIONAL	ALWAYS		In case it is provided by MWL	
Performed Procedure Code Sequence	(0040,A372)	MWL	ALWAYS	ALWAYS			
> Code Value	(0008,0100)	FIXED	ALWAYS	ALWAYS			
> Coding Scheme Designator	(0008,0102)	FIXED	ALWAYS	ALWAYS			
> Code Meaning	(0008,0104)	FIXED	ALWAYS	ALWAYS			
Current Requested Procedure Evidence Sequence	(0040,A375)	MWL	MWL	ALWAYS			

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Referenced Instance Sequence	(0008,114A)	MWL	MWL	ALWAYS			
> Referenced SOP Class UID	(0008,1150)	FIXED	ALWAYS	ALWAYS	1.2.840.10008.3.1.2.3.3		
> Referenced SOP Instance UID	(0008,1155)	GENERATED	ALWAYS	ALWAYS	1.3.12.2.1107.5.1.7. *+ serial number + part created per SOP Instance*		

Table A.1.1-11 SC Equipment Module Attributes

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Conversion Type	(0008,0064)	FIXED	ALWAYS	ALWAYS			
Modality	(0008,0060)	GENERATED, CONFIGURATION	ALWAYS	ALWAYS	OT; XA; CT (default = OT, *can be configured) (Captured Projection Image) XA (Bookmarks)*		
Secondary Capture Device Manufacturer	(0018,1016)	SRC_INSTANCE	ALWAYS	ALWAYS	Siemens Healthineers		
Secondary Capture Device Manufacturer's Model Name	(0018,1018)	SRC_INSTANCE	CONDITIONAL	ALWAYS	*Copied from (0008,1090)*	Not present for Secondary Capture Object "Patient Protocol"	
Secondary Capture Device Software Versions	(0018,1019)	CONFIGURATION	ALWAYS	ALWAYS	*from WS Configuration*		

Table A.1.1-12 Common Instance Reference Module Attributes

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Referenced Series Sequence	(0008,1115)	GENERATED	CONDITIONAL	ALWAYS		If both volumes are related to same study.	One item for each volume (registered space, registered volume)
>Referenced Instance Sequence	(0008,114A)	GENERATED	ALWAYS	ALWAYS			
>Series Instance UID	(0020,000E)	GENERATED	ALWAYS	ALWAYS	1.3.12.2.1107.5.1.7. *+ serial number + part created per Series Instance*		
Studies Containing Other Referenced Instances Sequence	(0008,1200)	GENERATED	CONDITIONAL	ALWAYS		If both volumes are related to different studies	
>Series Instance UID	(0020,000E)	GENERATED	ALWAYS	ALWAYS	1.3.12.2.1107.5.1.7. *+ serial number + part created per Series Instance*		
>Study Instance UID	(0020,000D)	GENERATED	ALWAYS	ALWAYS			

A.1.1.1 Macros

N/A

A.1.2 Common Functional Group Macros

N/A

A.1.3 Common Private Modules

The tables below list Private Attributes that are used in multiple IODs (see module overview in each IOD). For documentation convenience and readability, they are organized in modules, although the concept of modules does not exist in the standard for private Attributes.

Table A.1.3-1 Private Module General Equipment Attributes

Attribute Name	Tag	VR	VM	Identifiable Information	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Private Creator	(0029,00xx)	LO	1	SAFE	GENERATED	ALWAYS	ALWAYS	SIEMENS CT EXAM EQUIPMENT		
Detector Center	(0029,xx04)	SL	2	SAFE	GENERATED	ALWAYS	ALWAYS			
Detector Spacing	(0029,xx06)	FD	1	SAFE	GENERATED	ALWAYS	ALWAYS			
Model Type	(0029,xx09)	LT	1	SAFE	GENERATED	ALWAYS	ALWAYS			

Table A.1.3-2 Private Module ASPECT result information Attributes

Attribute Name	Tag	VR	VM	Identi-fiable Infor-mation	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Private Creator	(0019,00xx)	LO	1	SAFE	GENERATED	CONDITIONAL	ALWAYS	SIEMENS CT EXAM APP SHARED	Only used if CT Aspects app is used	
CT ASPECTS Region Information	(0019,xx07)	OB	1	SAFE	GENERATED	CONDITIONAL	ALWAYS		If CT ASPECTS is generating presentation states as results, then this Attribute will be present	

A.1.4 Common Coded Values

N/A

A.2 Basic Directory IOD

Table A.2-1 IOD of created Basic Directory Storage SOP Class Instances

IE	Module Name	Presence (Module)	Condition	Reference
Directory	File set Identification	ALWAYS		Table A.2.1-1
	Directory Information	ALWAYS		Table A.2.1-2

A.2.1 Basic Directory IOD Specific Modules

Table A.2.1-1 File Set Identification Module Attributes

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
File-set ID	(0004,1130)		ALWAYS	ALWAYS			
Specific Character Set of File-set Descriptor File	(0004,1142)		CONDITIONAL	ALWAYS		Required to specify the expanded or replacement character set. If absent, only the Basic Graphic set is used.	

Table A.2.1-2 Directory Information Module Attributes

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Offset of the First Directory Record of the Root Directory Entity	(0004,1200)		ALWAYS	ALWAYS			

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Offset of the Last Directory Record of the Root Directory Entity	(0004,1202)		ALWAYS	ALWAYS			
File-set Consistency Flag	(0004,1212)		ALWAYS	ALWAYS			
Directory Record Sequence	(0004,1220)		ALWAYS	ALWAYS			
>Offset of the Next Directory Record	(0004,1400)		ALWAYS	ALWAYS			
>Record In-use Flag	(0004,1410)		ALWAYS	ALWAYS			
>Offset of Referenced Lower-Level Directory Entity	(0004,1420)		ALWAYS	ALWAYS			
>Directory Record Type	(0004,1430)		ALWAYS	ALWAYS			
>Private Record UID	(0004,1432)		CONDITIONAL	ALWAYS		Required if the Directory Record Type (0004,1430) is of Value PRIVATE.	
>Referenced File ID	(0004,1500)		CONDITIONAL	ALWAYS		When the Directory Record does not reference any SOP Instance this Attribute shall not be present.	
>Referenced SOP Class UID in File	(0004,1510)		CONDITIONAL	ALWAYS		Required if the Directory Record references a SOP Instance.	

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
>Referenced SOP Instance UID in File	(0004,1511)		CONDITIONAL	ALWAYS		Required if the Directory Record references a SOP Instance.	
>Referenced Transfer Syntax UID in File	(0004,1512)		CONDITIONAL	ALWAYS		Required if the Directory Record references a SOP Instance.	
>Referenced Related General SOP Class UID in File	(0004,151A)		CONDITIONAL	ALWAYS		Required if the Directory Record references a SOP Instance that encodes the Related General SOP Class UID (0008,001A).	

A.2.2 Basic Directory IOD Functional Group Macros

N/A

A.2.3 Basic Directory IOD Private Modules

N/A

A.2.4 Basic Directory IOD Coded Values

N/A

A.3 CT Image IOD

Table A.3-1 IOD of created CT Image Storage SOP Class Instances

IE	Module Name	Presence (Module)	Condition	Reference
Patient	Patient	ALWAYS		Table A.1.1-1
Study	General Study	ALWAYS		Table A.1.1-2
	Patient Study	CONDITIONAL	Attributes of this module are not present in case of unscheduled patient, or when not delivered by MWL.	Table A.1.1-3
Series	General Series	ALWAYS		Table A.3.1-2
Equipment	General Equipment	ALWAYS		Table A.1.1-4
Acquisition	General Acquisition	ALWAYS		Table A.1.1-5
Frame of Reference	Frame of reference	ALWAYS		Table A.1.1-6
Image	General Image	ALWAYS		Table A.3.1-2
	General Reference	ALWAYS		Table A.3.1-1
	Image Plane	ALWAYS		Table A.3.1-3
	Image Pixel	ALWAYS		Table A.3.1-4
	Contrast/Bolus	CONDITIONAL	If contrast media was used in this image.	Table A.3.1-5
	CT Image	ALWAYS		Table A.3.1-6
	Multi-energy CT Image	CONDITIONAL	If Multi-energy CT Acquisition (0018,9361) is YES	Table A.3.1-7
	Overlay Plane	CONDITIONAL	In case of (0008,0008) is set to RECON REFERENCE or RANGE REFERENCE	Table A.3.1-8
	VOI LUT	ALWAYS		Table A.3.1-9
	SOP Common	ALWAYS		Table A.3.1-10
Private	CT Image	ALWAYS		Table A.3.3-1
	General Equipment	ALWAYS		Table A.1.3-1

IE	Module Name	Presence (Module)	Condition	Reference
	Image Plane	ALWAYS		Table A.3.3-2
	Osteo	CONDITIONAL	In case of an Osteo range	Table A.3.3-3

A.3.1 CT image IOD Specific Modules

Table A.3.1-2 General Series Module Attributes – CT Image

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Modality	(0008,0060)	FIXED	ALWAYS	ALWAYS	CT		
Series Instance UID	(0020,000E)	GENERATED	ALWAYS	ALWAYS	1.3.12.2.1107.5.1.7. *+ serial number + part created per Series Instance*		
Series Number	(0020,0011)	GENERATED	ALWAYS	ALWAYS	e.g: 703		Last 3 digit describes the series e.g. 1: full quality series, series with reference images, PACS Ready series 2: RTD series 4: ECG Documentation 5: reports 7: 3D camera images Topogram is described by 1 as the last digit

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Laterality	(0020,0060)	GENERATED	CONDITIONAL	EMPTY		Present if the body part examined is a paired structure	Arms and legs are paired structure, head not
Patient Position	(0018,5100)	GENERATED	ALWAYS	ALWAYS			
Series Date	(0008,0021)	GENERATED	ALWAYS	ALWAYS			
Series Time	(0008,0031)	GENERATED	ALWAYS	ALWAYS			
Protocol Name	(0018,1030)	USER, SRC_INSTANCE		ALWAYS	e.g. "Brain Factory"		
Series Description	(0008,103E)	GENERATED	ALWAYS	ALWAYS			
Operators' Name	(0008,1070)	MWL; USER	CONDITIONAL	ALWAYS		In case it is provided by MWL or entered by user	
Referenced Performed Procedure Step Sequence	(0008,1111)	MWL	ALWAYS	ALWAYS			
> Referenced SOP Class UID	(0008,1150)	FIXED	ALWAYS	ALWAYS	1.2.840.10008.3.1.2.3.3		
> Referenced SOP Instance UID	(0008,1155)	GENERATED	ALWAYS	ALWAYS	1.3.12.2.1107.5.1.7. *+ serial number + part created per SOP Instance*		
Body Part Examined	(0018,0015)	GENERATED	ALWAYS	ALWAYS			

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Request Attributes Sequence	(0040,0275)	MWL, GENERATED	ALWAYS	ALWAYS			
>Requested Procedure ID	(0040,1001)	MWL; USER; GENERATED	ALWAYS	ALWAYS			
>Accession Number	(0008,0050)	MWL; USER; GENERATED	ALWAYS	ALWAYS			
>Study Instance UID	(0020,000D)	MWL; USER; GENERATED	ALWAYS	ALWAYS			
>Requested Procedure Description	(0032,1060)	MWL	ALWAYS	ALWAYS			
>Requested Procedure Code Sequence	(0032,1064)	MWL	CONDITIONAL	ALWAYS		In case it is provided by MWL	
>> Code Value	(0008,0100)	FIXED	ALWAYS	ALWAYS			
>> Coding Scheme Designator	(0008,0102)	FIXED	ALWAYS	ALWAYS			
>> Code Meaning	(0008,0104)	FIXED	ALWAYS	ALWAYS			
>Reason for the Requested Procedure	(0040,1002)	MWL	ALWAYS	CONDITIONAL		In case it is provided by MWL	
>Requested Procedure Comments	(0040,1400)	MWL	ALWAYS	CONDITIONAL		In case it is provided by MWL	
>Scheduled Procedure Step Description	(0040,0007)	MWL	CONDITIONAL	ALWAYS		In case it is provided by MWL	

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
>Scheduled Procedure Step ID	(0040,0009)	MWL	CONDITIONAL	ALWAYS		In case it is provided by MWL	
>Scheduled Protocol Code Sequence	(0040,0008)	MWL	CONDITIONAL	ALWAYS		In case it is provided by MWL	
>> Code Value	(0008,0100)	FIXED	ALWAYS	ALWAYS			
>> Coding Scheme Designator	(0008,0102)	FIXED	ALWAYS	ALWAYS			
>> Code Meaning	(0008,0104)	FIXED	ALWAYS	ALWAYS			
Performed Procedure Step ID	(0040,0253)	MWL, GENERATED	ALWAYS	ALWAYS			
Performed Procedure Step Start Date	(0040,0244)	GENERATED	ALWAYS	ALWAYS			
Performed Procedure Step Start Time	(0040,0245)	GENERATED	ALWAYS	ALWAYS			
Performed Procedure Step Description	(0040,0254)	MWL, GENERATED	CONDITIONAL	ALWAYS		In case it is provided by MWL	
Performed Protocol Code Sequence	(0040,0260)	MWL	CONDITIONAL	ALWAYS	*Copied from Scheduled Protocol Code Sequence*	In case it is provide by MWL	
> Code Value	(0008,0100)	FIXED	ALWAYS	ALWAYS			
> Coding Scheme Designator	(0008,0102)	FIXED	ALWAYS	ALWAYS			

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
> Code Meaning	(0008,0104)	FIXED	ALWAYS	ALWAYS			

Table A.3.1-1 General Reference Module Attributes

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Referenced Image Sequence	(0008,1140)	GENERATED	ALWAYS	ALWAYS			
> Referenced SOP Class UID	(0008,1150)	FIXED	ALWAYS	ALWAYS	1.2.840.10008.5.1.4.1.1.2		
> Referenced SOP Instance UID	(0008,1155)	GENERATED	ALWAYS	ALWAYS	1.3.12.2.1107.5.1.7. *+ serial number + part created per SOP Instance*		
Source Image Sequence	(0008,2112)	GENERATED	CONDITIONAL	ALWAYS		If derived from single image	
> Referenced SOP Class UID	(0008,1150)	FIXED	ALWAYS	ALWAYS	1.2.840.10008.5.1.4.1.1.2		
> Referenced SOP Instance UID	(0008,1155)	GENERATED	ALWAYS	ALWAYS	1.3.12.2.1107.5.1.7. *+ serial number + part created per SOP Instance*		

Table A.3.1-2 General Image Module Attributes – CT Image

Attribute	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Instance Number	(0020,0013)	GENERATED	ALWAYS	ALWAYS	0 *for reference image*		

Attribute	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
					Number of image inside a series (started with 1)		
Content Date	(0008,0023)	GENERATED	ALWAYS	ALWAYS			
Content Time	(0008,0033)	GENERATED	ALWAYS	ALWAYS			
Image Type	(0008,0008)	GENERATED	ALWAYS	ALWAYS	*See Image Type Values A.3.4*		
Image Comments	(0020,4000)	USER; GENERATED	ALWAYS	ALWAYS	e.g.“Automatic Result; ME_70keV: Score9999; HD FoV,Artificial120, eDDensity; “60bpm; 75%; 400ms; Filter Sn		***Artificial120**: The resulting image values are proportional to the attenuation coefficient for a defined 120 kVp-like spectrum.* ***eDDensity**: Image values are proportional to electron density. (Electron density variant of DirectDensity)*
Burned in Annotation	(0028,0301)	FIXED	ALWAYS	ALWAYS	NO		
Lossy Image Compression	(0028,2110)	FIXED	ALWAYS	ALWAYS	00 = uncompressed; 01 = compressed;		
Irradiation Event UID	(0008,3010)	GENERATED	ALWAYS	ALWAYS			

Attribute	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Real World Value Mapping Sequence	(0040,9096)	GENERATED	CONDITIONAL	ALWAYS		In case of dual energy range or for specific kernels	
> LUT Explanation	(0028,3003)	GENERATED	ALWAYS	ALWAYS	Monoenergetic Plus; Virtual Unenhanced; Calcium Removed image; Iodine Removed image; Mixed; Low Energy Image; High Energy Image; Threshold 1 Image; Electron Density Image; Mass Density Image; Stopping Power Ratio Image		
> LUT Label	(0040,9210)	GENERATED	ALWAYS	ALWAYS	*See Image Type Values A.3.4 Value 4*		
> Measurement Units Code Sequence	(0040,08EA)	GENERATED	ALWAYS	ALWAYS			
>> Code Value	(0008,0100)	GENERATED	ALWAYS	ALWAYS	mg/cm3, [hnsf'U] ; ratio, g/cm3		
>> Code Scheme Designator	(0008,0102)	GENERATED	ALWAYS	ALWAYS	UCUM		
>>Code Meaning	(0008,0104)	GENERATED	ALWAYS	ALWAYS	mg/cm^3; Hounsfield Unit; ratio relative to water;		

Attribute	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
					g/cm3		
> Quantity Definition Sequence	(0040,9220)	GENERATED	CONDITIONAL	ALWAYS		Only in case of dual source dual energy recons	
>> Concept Name Code Sequence	(0040,A043)	GENERATED	ALWAYS	ALWAYS			
>>> Code Value	(0008,0100)	GENERATED	ALWAYS	ALWAYS	105590001		
>>> Code Scheme Designator	(0008,0102)	GENERATED	ALWAYS	ALWAYS	SCT		
>>>Code Meaning	(0008,0104)	GENERATED	ALWAYS	ALWAYS	Substance		
>> Concept Code Sequence	(0040,A168)	GENERATED	ALWAYS	ALWAYS			
>>> Code Value	(0008,0100)	GENERATED	ALWAYS	ALWAYS	11713004, 44588005, 5540006		
>> Code Scheme Designator	(0008,0102)	FIXED	ALWAYS	ALWAYS	SCT		
>>>Code Meaning	(0008,0104)	GENERATED	ALWAYS	ALWAYS	Water; Iodine; Calcium		
>Real World Value First Value Mapped	(0040,9216)	FIXED	ALWAYS	ALWAYS	0		
>Real World Value Last Value Mapped	(0040,9211)	FIXED	ALWAYS	ALWAYS	65535		
> Real World Value Intercept	(0040,9224)	GENERATED	ALWAYS	ALWAYS	-7.192; -819.2; -8192		
> Real World Value Slope	(0040,9225)	GENERATED	ALWAYS	ALWAYS	0.001; 0.1,1.0		

Table A.3.1-3 Image Plane Module Attributes

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Pixel Spacing	(0028,0030)	GENERATED	ALWAYS	ALWAYS			
Image Orientation (Patient)	(0020,0037)	GENERATED	ALWAYS	ALWAYS			
Image Position (Patient)	(0020,0032)	GENERATED	ALWAYS	ALWAYS			
Slice Thickness	(0018,0050)	GENERATED	ALWAYS	ALWAYS			
Slice Location	(0020,1041)	GENERATED	ALWAYS	ALWAYS			

Table A.3.1-4 Image Pixel Module Attributes

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Samples per Pixel	(0028,0002)	FIXED	ALWAYS	ALWAYS	1		
Photometric Interpretation	(0028,0004)		ALWAYS	ALWAYS	MONOCHROME 2		
Rows	(0028,0010)	GENERATED	ALWAYS	ALWAYS			
Columns	(0028,0011)	GENERATED	ALWAYS	ALWAYS			
Bits Allocated	(0028,0100)	FIXED	ALWAYS	ALWAYS	16		
Bits Stored	(0028,0101)	GENERATED	ALWAYS	ALWAYS	16		
High Bit	(0028,0102)	GENERATED	ALWAYS	ALWAYS	15		
Pixel Representation	(0028,0103)	FIXED	ALWAYS	ALWAYS	000H		
Planar Configuration	(0028,0006)	GENERATED	CONDITIONAL	ALWAYS		Required if Samples per Pixel (0028,0002) has a value greater than 1.	

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Pixel Data	(7FE0,0010)	GENERATED	ALWAYS	ALWAYS			

Table A.3.1-5 Contrast/Bolus Module Attributes

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Contrast/Bolus Agent	(0018,0010)	GENERATED	ALWAYS	ALWAYS	*Name of the agent* UNDEFINED		- Name of the agent if known - "UNDEFINED" if agent is used but unknown - The DICOM expectation "Presence of value: NONE" in case of an unknown agent is not met
Contrast/Bolus Volume	(0018,1041)	GENERATED	ALWAYS	ALWAYS			
Contrast/Bolus Start Time	(0018,1042)	GENERATED	ALWAYS	ALWAYS			
Contrast/Bolus Stop Time	(0018,1043)	GENERATED	ALWAYS	ALWAYS			
Contrast/Bolus Total Dose	(0018,1044)	GENERATED	ALWAYS	ALWAYS	*NOTE: Total amount in [mL] of the undiluted contrast agent – EXCLUDING Saline*		
Contrast Flow Rate	(0018,1046)	GENERATED	ALWAYS	ALWAYS			Multiple entries are possible (e.g. in case of e.g. multiphase injection protocols), Unit [mL/s]
Contrast Flow Duration	(0018,1047)	GENERATED	ALWAYS	ALWAYS			Multiple entries are possible (e.g. in case e.g. multiphase injection protocols), Unit: [s]
Contrast/Bolus Ingredient	(0018,1048)	GENERATED	ALWAYS	ALWAYS	IODINE		

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Contrast/Bolus Ingredient Concentration	(0018,1049)	FIXED	ALWAYS	ALWAYS			[mg] of active ingredient per [mL] of (diluted) agent

Table A.3.1-6 CT Image Module Attributes

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Image Type	(0008,0008)	GENERATED	ALWAYS	ALWAYS	*See Image Type Values A.3.4*		
Samples per Pixel	(0028,0002)	FIXED	ALWAYS	ALWAYS	1		
Photometric Interpretation	(0028,0004)	FIXED	ALWAYS	ALWAYS	MONOCHROME2		
Bits Allocated	(0028,0100)	FIXED	ALWAYS	ALWAYS	16		
Bits Stored	(0028,0101)	FIXED	ALWAYS	ALWAYS	16		
High Bit	(0028,0102)	FIXED	ALWAYS	ALWAYS	15		
Rescale Intercept	(0028,1052)	GENERATED	ALWAYS	ALWAYS	-8192		
Rescale Slope	(0028,1053)	GENERATED	ALWAYS	ALWAYS	1		
Rescale Type	(0028,1054)	GENERATED	CONDITIONAL	ALWAYS	*See Rescale Type Values A.3.4.3 and A.3.4.4*	if the Rescale Type is not HU (Hounsfield Units), or Multi-energy CT Acquisition (0018,9361) is YES	
KVP	(0018,0060)	GENERATED	CONDITIONAL	ALWAYS		Empty if this Attribute is present in Multi-energy CT Acquisition	

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
						Sequence (0018,9362)	
Acquisition Number	(0020,0012)	GENERATED	ALWAYS	ALWAYS			
Scan Options	(0018,0022)	SRC_INSTANCE	CONDTIONAL	ALWAYS	*Contains cardiac or respiratory information, from Original -*	In case original is CT image	
Data Collection Diameter	(0018,0090)	GENERATED	ALWAYS	ALWAYS			
Reconstruction Diameter	(0018,1100)	GENERATED	ALWAYS	ALWAYS			
Distance Source to Detector	(0018,1110)	GENERATED	ALWAYS	ALWAYS			
Distance Source to Patient	(0018,1111)	GENERATED	ALWAYS	ALWAYS			
Gantry/Detector Tilt	(0018,1120)	GENERATED	ALWAYS	ALWAYS			
Table Height	(0018,1130)	GENERATED	ALWAYS	ALWAYS			
Rotation Direction	(0018,1140)	GENERATED	ALWAYS	ALWAYS	CW;CCW		
Exposure Time	(0018,1150)	GENERATED	ALWAYS	ALWAYS			
X-Ray Tube Current	(0018,1151)	GENERATED	ALWAYS	ALWAYS			
Exposure	(0018,1152)	GENERATED	ALWAYS	ALWAYS	*Product of X-Ray Tube Current and Exposure Time. Unit is [mAs].*		
Filter Type	(0018,1160)	GENERATED	ALWAYS	ALWAYS	SN_DE; SN_DESF; AU_DESF; AUSN_DESF; SN_LD; W1;W1 SN_LD;		

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
					W12;“		
Generator Power	(0018,1170)	GENERATED	ALWAYS	ALWAYS			
Focal Spot(s)	(0018,1190)	GENERATED	ALWAYS	ALWAYS			
Convolution Kernel	(0018,1210)	GENERATED	ALWAYS	ALWAYS	e.g. Sa;Sd		Sd for eDDensity, Sa for Artifical120 Artifical120 : The resulting image values are proportional to the attenuation coefficient for a defined 120 kVp-like spectrum. eDDensity : image values are proportional to electron density. (Electron density variant of DirectDensity)
Single Collimation Width	(0018,9306)	GENERATED	ALWAYS	ALWAYS			
Total Collimation Width	(0018,9307)	GENERATED	ALWAYS	ALWAYS			
Table Speed	(0018,9309)	GENERATED	CONDITIONAL	ALWAYS		Only for CT Spiral scans	
Table Feed per Rotation	(0018,9310)	GENERATED	CONDITIONAL	ALWAYS		Only for CT Sequence scans	
Spiral Pitch Factor	(0018,9311)	GENERATED	CONDITIONAL	ALWAYS		Only for CT Spiral scans	

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Exposure Modulation Type	(0018,9323)	GENERATED	ALWAYS	ALWAYS	OFF_OFF; OFF_OFF_MINDO; OFF_OFF_PULS; OFF_MAC; OFF_MAC_MINDO; OFF_MAC_PULS; OFF_ZEC; OFF_ZEC_MINDO; OFF_ZEC_PULS; SHAPE_OFF; SHAPE_OFF_MINDO; SHAPE_OFF_PULS; SHAPE_MAC; SHAPE_MAC_MINDO; SHAPE_MAC_PULS; SHAPE_ZEC; SHAPE_ZEC_MINDO; SHAPE_ZEC_PULS; SINOD_OFF; SINOD_OFF_MINDO; SINOD_OFF_PULS; SINOD_MAC; SINOD_MAC_MINDO; SINOD_MAC_PULS; SINOD_ZEC; SINOD_ZEC_MINDO; SINOD_ZEC_PULS; ELLIP_OFF; ELLIP_OFF_MINDO; ELLIP_OFF_PULS; ELLIP_MAC;		

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
					ELLIP_MAC_MINDO; ELLIP_MAC_PULS; ELLIP_ZEC; ELLIP_ZEC_MINDO; ELLIP_ZEC_PULS; XCARE_OFF; XCARE_OFF_MINDO ; XCARE_OFF_PULS; XCARE_MAC; XCARE_MAC_MINDO; XCARE_MAC_PULS; XCARE_ZEC: XCARE_ZEC_MINDO : XCARE_ZEC_PULS		
CTDIvol	(0018,9345)	GENERATED	CONDITIONAL	ALWAYS		Not present if Multi-energy CT Acquisition (0018,9361) is YES	
CTDI Phantom Type Code Sequence	(0018,9346)	FIXED	CONDITIONAL	ALWAYS		Not present if Multi-energy CT Acquisition (0018,9361) is YES	
>Code Value	(0008,0100)	FIXED	ALWAYS	ALWAYS	113691		
>Coding Scheme Designator	(0008,0102)	FIXED	ALWAYS	ALWAYS	DCM		
>Code Meaning	(0008,0104)	FIXED	ALWAYS	ALWAYS	IEC Body Dosimetry Phantom		
Calcium Scoring Mass Factor Device Attribute	(0018,9352)	FIXED	CONDITIONAL	ALWAYS	e.g. W1 SN_LD	Present if Calcium Scoring app is used	

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Energy Weighting Factor	(0018,9353)	GENERATED	CONDITIONAL	ALWAYS		Not present if Multi-energy CT Acquisition (0018,9361) is YES	
CT Additional X-Ray Source Sequence	(0018,9360)	GENERATED	CONDITIONAL	ALWAYS		Not present if Multi-energy CT Acquisition (0018,9361) is YES [1]	
>Focal Spot(s)	(0018,1190)	GENERATED	ALWAYS	ALWAYS			
>Energy Weighting Factor	(0018,9353)	GENERATED	ALWAYS	CONDITIONAL		Present in case of Multi-energy scan	
Multi-energy CT Acquisition	(0018,9361)	CONFIGURATION	CONDITIONAL	ALWAYS	YES NO	Present in case of Multi-energy scan	

Table A.3.1-7 Multi-energy CT Image Module Attributes

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Multi-energy CT Acquisition Sequence	(0018,9362)	GENERATED	ALWAYS	ALWAYS			
>Multi-energy Acquisition Description	(0018,937B)	GENERATED	ALWAYS	ALWAYS			

[1] The system provides the option to switch on/off the support of the Supplement 188.

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
>Multi-energy CT X-Ray Source Sequence	(0018,9365)	GENERATED	ALWAYS	ALWAYS			
>>X-Ray Source Index	(0018,9366)	GENERATED	ALWAYS	ALWAYS			
>>X-Ray Source ID	(0018,9367)	GENERATED	ALWAYS	ALWAYS			
>>Multi-energy Source Technique	(0018,9368)	FIXED	ALWAYS	ALWAYS			
>>Source Start DateTime	(0018,9369)	GENERATED	ALWAYS	ALWAYS			
>>Source End DateTime	(0018,936A)	GENERATED	ALWAYS	ALWAYS			
>>Generator Power	(0018,1170)	GENERATED	ALWAYS	ALWAYS			
>CT Exposure Sequence	(0018,9321)	GENERATED	ALWAYS	ALWAYS			
>>Referenced X-Ray Source Index	(0018,9377)	GENERATED	ALWAYS	ALWAYS			
Structured report>>Estimated Dose Saving [2]	(0018,9324)	EMPTY	ALWAYS	ALWAYS			
>>Exposure Time in ms	(0018,9328)	GENERATED	ALWAYS	ALWAYS			
>>X-Ray Tube Current in mA	(0018,9330)	GENERATED	ALWAYS	ALWAYS			
>>Exposure in mAs	(0018,9332)	GENERATED	ALWAYS	ALWAYS			
>> Exposure Modulation Type	(0018,9323)	GENERATED	ALWAYS	ALWAYS			

.

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
>>CTDIvol	(0018,9345)	GENERATED	ALWAYS	ALWAYS			
>> CTDI Phantom Type Code Sequence	(0018,9346)	GENERATED	CONDITIONAL	ALWAYS		Not present if Multienergy CT Acquisition (0018,9361) is YES	
>>> Code Value	(0008,0100)	FIXED	ALWAYS	ALWAYS	113691		
>>> Coding Scheme Designator	(0008,0102)	FIXED	ALWAYS	ALWAYS	DCM		
>>> Code Meaning	(0008,0104)	FIXED	ALWAYS	ALWAYS	IEC Body Dosimetry Phantom		
>Multi-energy CT X-Ray Detector Sequence	(0018,936F)	GENERATED	ALWAYS	ALWAYS			
>> X-Ray Detector Index	(0018,9370)	GENERATED	ALWAYS	ALWAYS			
>> X-Ray Detector ID	(0018,9371)	GENERATED	ALWAYS	ALWAYS			
>> Multi-energy Detector Type	(0018,9372)	GENERATED	ALWAYS	ALWAYS			
>> Nominal Max Energy	(0018,9374)	GENERATED	ALWAYS	ALWAYS			
>> Nominal Min Energy	(0018,9375)	GENERATED	ALWAYS	ALWAYS			
>Multi-energy CT Path Sequence	(0018,9379)	GENERATED	ALWAYS	ALWAYS			
>> Multi-energy CT Path Index	(0018,937A)	GENERATED	ALWAYS	ALWAYS			
>> Referenced X-Ray Source Index	(0018,9377)	GENERATED	ALWAYS	ALWAYS			

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
>>Referenced X-Ray Detector Index	(0018,9376)	GENERATED	ALWAYS	ALWAYS			
>CT Acquisition Details Sequence	(0018,9304)	GENERATED	ALWAYS	ALWAYS			
>> Referenced Path Index	(0018,9378)	GENERATED	ALWAYS	ALWAYS			
>> Rotation Direction	(0018,1140)	FIXED	ALWAYS	ALWAYS			
>> Revolution Time	(0018,9305)	GENERATED	ALWAYS	ALWAYS			
>> Single Collimation Width	(0018,9306)	GENERATED	ALWAYS	ALWAYS			
>> Total Collimation Width	(0018,9307)	GENERATED	ALWAYS	ALWAYS			
>> Table Height	(0018,1130)	GENERATED	ALWAYS	ALWAYS			
>> Gantry/Detector Tilt	(0018,1120)	GENERATED	ALWAYS	ALWAYS			
>> Data Collection Diameter	(0018,0090)	GENERATED	ALWAYS	ALWAYS			
> CT X-Ray Details Sequence	(0018,9325)	GENERATED	ALWAYS	ALWAYS			
>> Referenced Path Index	(0018,9378)	GENERATED	ALWAYS	ALWAYS			
>> KVP	(0018,0060)	GENERATED	ALWAYS	ALWAYS			
>>Filter Type	(0018,1160)	GENERATED	ALWAYS	ALWAYS			
>>Focal Spot(s)	(0018,1190)	GENERATED	ALWAYS	ALWAYS			
>> Filter Material	(0018,7050)	GENERATED	ALWAYS	ALWAYS			
>>Energy Weighting Factor	(0018,9353)	GENERATED	CONDITIONAL	ALWAYS		Present in case of Multi-Energy scan	

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
> CT Geometry Sequence	(0018,9312)	GENERATED	ALWAYS	ALWAYS			
>> Referenced Path Index	(0018,9378)	GENERATED	ALWAYS	ALWAYS			
>> Distance Source to Detector	(0018,1110)	GENERATED	ALWAYS	ALWAYS			
>> Distance Source to Data Collection Center	(0018,9335)	GENERATED	ALWAYS	ALWAYS			
Multi-energy CT Processing Sequence	(0018,9363)	GENERATED	CONDITIONAL	ALWAYS		Present in case of Multi-Energy scan	
> Decomposition Method	(0018,937E)	GENERATED	ALWAYS	ALWAYS			
> Decomposition Description	(0018,937F)	GENERATED	ALWAYS	ALWAYS			
Multi-energy CT Characteristics Sequence	(0018,9364)	GENERATED	CONDITIONAL	ALWAYS		Present in case of Multi-Energy scan	
> Monoenergetic Energy Equivalent	(0018,937C)	GENERATED	ALWAYS	ALWAYS			
> Derivation Algorithm Sequence	(0022,1612)	GENERATED	ALWAYS	ALWAYS			
>> Algorithm Family Code Sequence	(0066,002F)	GENERATED	ALWAYS	ALWAYS			
>>> Code Value	(0008,0100)	FIXED	ALWAYS	ALWAYS	123108		

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
>>> Coding Scheme Designator	(0008,0102)	FIXED	ALWAYS	ALWAYS	DCM		
>>> Code Meaning	(0008,0104)	FIXED	ALWAYS	ALWAYS	Multispectral Processing		
>>Algorithm Name	(0066,0036)	GENERATED	ALWAYS	ALWAYS			
>>Algorithm Version	(0066,0031)	FIXED	ALWAYS	ALWAYS	VB20A		
>>Algorithm Source	(0024,0202)	FIXED	ALWAYS	ALWAYS	Siemens Healthineers		
> Performed Processing Parameters Sequence	(0074,1212)	GENERATED	ALWAYS	ALWAYS			
>> Value Type	(0040, A040)	GENERATED	ALWAYS	ALWAYS			
>> Concept Name Code Sequence	(0040, A043)	GENERATED	ALWAYS	ALWAYS			
>>> Code Value	(0008,0100)	FIXED	ALWAYS	ALWAYS			
>>> Coding Scheme Designator	(0008,0102)	FIXED	ALWAYS	ALWAYS			
>>> Code Meaning	(0008,0104)	FIXED	ALWAYS	ALWAYS			
>> Text Value	(0040, A160)	GENERATED	ALWAYS	ALWAYS			

Table A.3.1-8 Overlay Plane Module Attributes – CT Image

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Overlay Rows	(60xx,0010)	GENERATED	ALWAYS	ALWAYS			
Overlay Columns	(60xx,0011)	GENERATED	ALWAYS	ALWAYS			
Overlay Type	(60xx,0040)	GENERATED	ALWAYS	ALWAYS			

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Overlay Origin	(60xx,0050)	GENERATED	ALWAYS	ALWAYS			
Overlay Bits Allocated	(60xx,0100)	FIXED	ALWAYS	ALWAYS	1		
Overlay Bit Position	(60xx,0102)	FIXED	ALWAYS	ALWAYS	0		
Overlay Data	(60xx,3000)	GENERATED	ALWAYS	ALWAYS			

Table A.3.1-9 VOI LUT Module Attributes

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
VOI LUT Sequence	(0028,3010)	SRC_INSTANCE	CONDITIONAL	ALWAYS		Required if Window Center (0028,1050) is not present. May be present otherwise.	
>LUT Descriptor	(0028,3002)	SRC_INSTANCE	ALWAYS	ALWAYS			
>LUT Data	(0028,3006)	SRC_INSTANCE	ALWAYS	ALWAYS			
Window Center	(0028,1050)	GENERATED	CONDITIONAL	ALWAYS		Required if VOI LUT Sequence (0028,3010) is not present.	
Window Width	(0028,1051)	GENERATED	CONDITIONAL	ALWAYS		Required if Window Center (0028,1050) is present.	
Window Center & Width Explanation	(0028,1055)	GENERATED	CONDITIONAL	ALWAYS		If Window Center (0028,1050) is present	

Table A.3.1-10 SOP Common Module Attributes

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
SOP Class UID	(0008,0016)	FIXED	ALWAYS	ALWAYS	1.2.840.10008.5.1.4.1.1.2		
SOP Instance UID	(0008,0018)	GENERATED	ALWAYS	ALWAYS	1.3.12.2.1107.5.1.7. *+ serial number + part created per SOP Instance*		
Specific Character Set	(0008,0005)	MWL; GENERATED, CONFIGURATION	ALWAYS	ALWAYS			
Timezone Offset From UTC	(0008,0201)	GENERATED	ALWAYS	ALWAYS			
Original Attributes Sequence	(0400,0561)	MWL	CONDITIONAL	ALWAYS		Present in case of patient data correction	
> Modified Attributes Sequence	(0400,0550)	GENERATED	ALWAYS	ALWAYS			
> Attribute Modification Date Time	(0400,0562)	GENERATED	ALWAYS	ALWAYS	*Date of correction*		
> Modifying System	(0400,0563)	GENERATED	ALWAYS	ALWAYS	*Manufacturer's Model Name + Software Versions +* 999999		
> Source of Previous Values	(0400,0564)	GENERATED	ALWAYS	EMPTY			
> Reason for the Attribute Modification	(0400,0565)	FIXED	ALWAYS	ALWAYS	COERCE		

A.3.2 CT image IOD Functional Group Macros

N/A

A.3.3 CT image IOD Private Modules

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Table A.3.3-1 Private Module CT Image Attributes

Attribute Name	Tag	VR	VM	Identifiable Information	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Private Creator	(0019,00xx)	LO	1	SAFE	GENERATED	ALWAYS	ALWAYS	SIEMENS CT EXAM APP SHARED		
Reference MAs	(0019,xx02)	UL	2	SAFE	GENERATED	ALWAYS	ALWAYS			
Physicists Line	(0019,xx03)	LO	1	SAFE	GENERATED	ALWAYS	ALWAYS			
Multiphase UID	(0019,xx05)	LO	1	SAFE	GENERATED	CONDITIONAL	ALWAYS		Only in case of series splitting	
Private Creator	(0029,00xx)	LO	1	SAFE	GENERATED	ALWAYS	ALWAYS	SIEMENS CT EXAM IMAGE		
Attenuation Profile Projected	(0029,xx01)	FD	n	SAFE	GENERATED	CONDITIONAL	ALWAYS		Present for image type CT_SOM5 TOP	
Attenuation Profile Perpendicular	(0029,xx02)	FD	1	SAFE	GENERATED	CONDITIONAL	ALWAYS		Present for image type CT_SOM5 TOP	
Cardio Scan Duration	(0029,xx06)	UL	1	SAFE	GENERATED	ALWAYS	ALWAYS	0 *in case of image type*		

Attribute Name	Tag	VR	VM	Identifiable Information	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
								CT_SOM5 TOP		
Kernel Content Version	(0029,xx07)	UL	1	SAFE	GENERATED	ALWAYS	ALWAYS			
Dual Energy Parameters	(0029,xx08)	LO	n	SAFE	GENERATED	CONDITIONAL	ALWAYS		In case of dual energy range	
Flying Focal Spot	(0029,xx0D)	LO	1	SAFE	GENERATED	ALWAYS	ALWAYS			
Focus Size Type	(0029,xx0E)	LO	1	SAFE	GENERATED	ALWAYS	ALWAYS			
Fused Rows	(0029,xx0F)	UL	1	SAFE	GENERATED	ALWAYS	ALWAYS			
Iterative Beam Hardening Correction Type	(0029,xx10)	LO	1	SAFE	FIXED?	ALWAYS	ALWAYS	SIEMENS MEDCOM HEADER		
Iterative Recon Type	(0029,xx11)	LO	1	SAFE	GENERATED	ALWAYS	ALWAYS			
Is Cardio	(0029,xx13)	LO	1	SAFE	GENERATED	ALWAYS	ALWAYS			
Is High Pitch	(0029,xx14)	LO	1	SAFE	GENERATED	ALWAYS	ALWAYS			
Is Intervention	(0029,xx15)	LO	1	SAFE	GENERATED	ALWAYS	ALWAYS			
Is Quick Recon	(0029,xx16)	LO	1	SAFE	GENERATED	ALWAYS	ALWAYS			
Is Quick Scan	(0029,xx17)	LO	1	SAFE	GENERATED	ALWAYS	ALWAYS			
Is Respiratory	(0029,xx18)	LO	1	SAFE	GENERATED	ALWAYS	ALWAYS			

Attribute Name	Tag	VR	VM	Identifiable Information	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Blending Factor Of Original Or Corrected Image	(0029,xx19)	FD	1	SAFE	GENERATED	ALWAYS	ALWAYS			
ITR Mode	(0029,xx1A)	LT	1	SAFE	GENERATED	ALWAYS	ALWAYS			
Voltage Reference Mode	(0029,xx1C)	FD	2	SAFE	GENERATED	ALWAYS	ALWAYS			
Effective MAs	(0029,xx1D)	UL	1-2	SAFE	GENERATED	ALWAYS	ALWAYS			
Maximal Number Of Collimations	(0029,xx1E)	UL	1	SAFE	GENERATED	ALWAYS	ALWAYS			
Additional Image Mirroring	(0029,xx1F)	UL	1	SAFE	GENERATED		ALWAYS			
Topogram Length	(0029,xx20)	FD	1	SAFE	USER	CONDITIONAL	ALWAYS		Present in case of topogram	
Moveable Filters	(0029,xx21)	SL	1	SAFE	GENERATED		ALWAYS			
Number Of Slices Selected For Scan	(0029,xx22)	SL	1	SAFE	GENERATED	ALWAYS	ALWAYS			
Name Of Organ Characteristics	(0029,xx24)	LT	1	SAFE	GENERATED		ALWAYS			

Attribute Name	Tag	VR	VM	Identifiable Information	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Original Field Of View Height	(0029,xx27)	FD	2	SAFE	GENERATED	ALWAYS	ALWAYS			
Original Topogram UID	(0029,xx29)	LO	n	SAFE	GENERATED		ALWAYS			
Patient Phase Of Life	(0029,xx2A)	LO	1	SAFE	GENERATED	ALWAYS	ALWAYS			
Physical Corrections	(0029,xx2B)	UL	1	SAFE	GENERATED	ALWAYS	ALWAYS			
Physical Slices	(0029,xx2C)	UL	1	SAFE	GENERATED	ALWAYS	ALWAYS			
Quick Scan Artefact Reduction	(0029,xx2E)	LO	1	SAFE	GENERATED	ALWAYS	ALWAYS			
Raw Data ID	(0029,xx2F)	LT	1	SAFE	GENERATED	ALWAYS	ALWAYS			
Reconstruction Algorithm	(0029,xx30)	LO	1	SAFE	GENERATED		ALWAYS			
Reconstruction Angle	(0029,xx31)	UL	1	SAFE	GENERATED	ALWAYS	ALWAYS			
Reconstruction Tubes	(0029,xx33)	UL	1	SAFE	GENERATED	???	ALWAYS			
Referenced Studies	(0029,xx36)	LO	n	SAFE	GENERATED		ALWAYS			
Rotation Time	(0029,xx37)	UL	1	SAFE	GENERATED	CONDITIONAL	ALWAYS		Not present for topogram	
Scan Table Position	(0029,xx38)	FD	1	SAFE	GENERATED	CONDITIONAL	ALWAYS		Not present for topogram	

Attribute Name	Tag	VR	VM	Identifiable Information	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Scatter Correction Active	(0029,xx39)	LO	1	SAFE	GENERATED	ALWAYS	ALWAYS			
Sequence Scan Time	(0029,xx3A)	UL	1	SAFE	GENERATED	CONDITIONAL	ALWAYS		Present for sequence scans	
Start Angle	(0029,xx3B)	UL	1	SAFE	GENERATED		ALWAYS			
Tube Position	(0029,xx3C)	UL	1	SAFE	GENERATED		ALWAYS			
Topo Header Size	(0029,xx3F)	UL	1	SAFE	GENERATED		ALWAYS			
Bolus Premonitoring Mean HU Value	(0029,xx40)	SL	1	SAFE	GENERATED	CONDITIONAL	ALWAYS		Present in case of Bolus ranges	
Bolus Premonitoring Series UID	(0029,xx41)	UI	1	SAFE	GENERATED	CONDITIONAL	ALWAYS		Present in case of Bolus ranges	
Bolus Monitoring Mean HU Value	(0029,xx42)	SL	1	SAFE	GENERATED	CONDITIONAL	ALWAYS		Present in case of Bolus ranges	
Iterative Reconstruction Strength	(0029,xx43)	UL	1	SAFE	GENERATED	ALWAYS	ALWAYS			
Attenuation Profile Pat Center	(0029,xx44)	FD	1	SAFE	GENERATED	CONDITIONAL	ALWAYS		Present only for topograms	
Dose Modulation Factor High	(0029,xx45)	FD	1	SAFE	GENERATED	CONDITIONAL	ALWAYS		Present not for topograms	

Attribute Name	Tag	VR	VM	Identifiable Information	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Dose Modulation Factor Low	(0029,xx46)	FD	1	SAFE	GENERATED	CONDITIONAL	ALWAYS		Present not for topograms	
Short Detector Width	(0029,xx47)	SL	1	SAFE	GENERATED	CONDITIONAL	ALWAYS		Present only for topograms	
Extended Field Of View Algorithm	(0029,xx48)	LO	1	SAFE	GENERATED	ALWAYS	ALWAYS			
Metal Artifact Reduction Type	(0029,xx49)	LO	1	SAFE	GENERATED	CONDITIONAL	ALWAYS		Only if (0029,xx11) is IMAR	
Dual Energy Composition	(0029,xx4A)	FD	1	SAFE	GENERATED	CONDITIONAL	ALWAYS		In case of dual source	
Field of View of System B	(0029,xx4B)	FD	1	SAFE	GENERATED	CONDITIONAL	ALWAYS		In case of dual source	
Patient Diameter	(0029,xx4C)	FD	2	SAFE	GENERATED	CONDITIONAL	ALWAYS		In case of dual source	
Iso Center	(0029,xx4D)	FD	2	SAFE	GENERATED		ALWAYS			
Care Dose 4D and CarekV	(0029,xx4E)	LO	1	SAFE	USER		ALWAYS			
Relevant Contrast	(0029,xx4F)	LO	1	SAFE	GENERATED		ALWAYS			
IQ mAs	(0029,xx50)	LO	1	SAFE	GENERATED		ALWAYS			
CarekV Min	(0029,xx51)	LO	1	SAFE	GENERATED	CONDITIONAL	ALWAYS		In case of dual energy range	
CarekV Max	(0029,xx52)	LO	1	SAFE	GENERATED	CONDITIONAL	ALWAYS		In case of dual energy range	

Attribute Name	Tag	VR	VM	Identifiable Information	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
DualEnergy Application Version	(0029,xx54)	LO	1	SAFE	GENERATED	CONDITIONAL	ALWAYS		In case of dual energy range	
Intervention Volume Recon	(0029,xx55)	LO	1	SAFE	GENERATED	CONDITIONAL	ALWAYS		In case of intervention range	
Intervention Timepoint Id	(0029,xx56)	LO	1	SAFE	GENERATED	CONDITIONAL	ALWAYS		In case of intervention range	
Attenuation Profile Diameter Water Cylinder	(0029,xx57)	FD	1	SAFE	GENERATED	CONDITIONAL	ALWAYS		Present only for topograms	

Table A.3.3-2 Private Module Image Plane Attributes

Attribute Name	Tag	VR	VM	Identifiable Information	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Private Creator	(0029,00xx)	LO	1	SAFE	GENERATED			SIEMENS CT EXAM IMAGE		
Original Field Of View	(0029,xx26)	FD	2	SAFE	GENERATED	ALWAYS	ALWAYS			
Original Target Center	(0029,xx28)	FD	2	SAFE	GENERATED	ALWAYS	ALWAYS			
Private Creator	(0021,00xx)	LO	1	SAFE	GENERATED			SIEMENS MED		
Target	(0021,xx11)	DS	2	SAFE	GENERATED		*ALWAYS*			

Table A.3.3-3 Private Module Osteo Module Attributes

Attribute Name	Tag	VR	VM	Identifiable Information	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Private Creator	(0029,00xx)	LO	1	SAFE	GENERATED			SIEMENS CT EXAM APP SHARED		
Osteo Calibration Table Height	(0019,xx01)	DS	1	SAFE	GENERATED	CONDITIONAL	ALWAYS		In case of an Osteo range	
Private Creator	(0029,00xx)	LO	1	SAFE	GENERATED			SIEMENS CT VA0 COAD		
Osteo Offset	(0019,xx90)	DS	1	SAFE	GENERATED	CONDITIONAL	ALWAYS		In case of an Osteo range	
Osteo Phantom Number	(0019,xx96)	IS	1	SAFE	GENERATED	CONDITIONAL	ALWAYS		In case of an Osteo range	
Osteo Regression Line Intercept	(0019,xx93)	DS	1	SAFE	GENERATED	CONDITIONAL	ALWAYS		In case of an Osteo range	
Osteo Regression Line Slope	(0019,xx92)	DS	1	SAFE	GENERATED	CONDITIONAL	ALWAYS		In case of an Osteo range	

A.3.4 CT image IOD Coded Values

A.3.4.1 Image Type Values

- Value 1 identifies the Pixel Data Characteristics; Enumerated Values for the Pixel Data Characteristics are:
  - ORIGINAL: Identifies an Original Image
  - DERIVED: Identifies a Derived Image
- Value 2 identifies the Patient Examination Characteristics; Enumerated Values for the Patient Examination Characteristics are:
  - PRIMARY: Identifies a Primary Image
  - SECONDARY: Identifies a Secondary Image

- Value 3 identifies any Image IOD-specific specialization. The following terms are defined in addition to the DICOM standard definitions:
    - AXIAL: identifies a CT cross-sectional image
    - LOCALIZER: Identifies a CT Localizer Image
    - OTHER: Converted non-Axial and non-Localizer CT images
      Note: AXIAL in this context means any cross-sectional image, and includes transverse, coronal, sagittal and oblique images.
- Value 4 is implementation specific:
    - CT_SOM5 RTD: identifies a Real Time Display Image
    - CT_SOM5 MIP: identifies a Maximum Intensity Projection image created by a CT application of a non-fix-axial Spiral Range
    - CT_SOM5 MPR: identifies Multi Planar Reconstruction image created by a CT application of non-fix-axial Spiral range
    - CT_SOM5 MON: identifies an image of a Monitoring or Premonitoring range
    - CT_SOM5 ROT: identifies an image of a ROT range
    - CT_SOM5 SEQ: identifies an image of a Sequence range
    - CT_SOM5 SPI: identifies an image of a fix-axial Spiral range
    - CT_SOM5 STA: identifies an image of a Static range
    - CT_SOM5 TOP: identifies an image of a Topogram range
    - CT_SOM8 DESPR: identifies Stopping Power Ratio (SPR) images
    - CT_SOM8 DEMEP: identifies Monoenergetic reconstructions out of two energy spectra
    - CT_SOM10 DEMEP: identifies Monoenergetic reconstructions out of two energy spectra
    - CT_SOM10 DEMIX: identifies mixed reconstructions out of two energy spectra
    - CT_SOM10 DEVNC: identifies VNC or Iodine reconstructions out of two energy spectra
    - 4D SPI: identifies an image of a ZigZag range
    - CSA BLACK IMAGE: identifies an SC Image with black pixels; only graphics information is of interest
    - CT_SOM PROT: identifies an SC Image with black pixels; only graphics information is of interest
    - FLU: identifies an image of a fluoroscopy range
    - CT_SOM_ECGDOC: identifies an ECG documentation image
    - MPR: identifies Multi Planar Reconstruction image
    - MIP: identifies Maximum Intensity Projection image
    - MINIP: identifies Minimum Intensity Projection
    - SYNCT_HEAD: identifies Synthetic CT image (Head)
    - SYNCT_PELVIS: identifies Synthetic CT image (Pelvis)
    - THRESHOLD: identifies image at a specific energy threshold (see [3])
    - VMI identifies a Virtual Monoenergetic Image

[3] THRESHOLD images are reconstructed from all photons registered at the detector above a certain energy threshold, e.g. above 25keV. The actual thresholds are denoted as T1, T2, ..., with T1 being the lowest threshold.

  - MAT_SPECIFIC identifies a Material-Specific Image
  - MAT_REMOVED identifies a Material-Removed Image

- Value 5 is specific to syngo CT products
  - STD: Standard image of corresponding Type as given in value 4.
  - OTOM: Osteo Scanned Tomogram
  - OTOP: Osteo Scanned Topogram
  - PMON: Premonitoring Scan
  - TBOL: Testbolus Scan
  - RECON REFERENCE: identifies an image containing overlay graphics indicating the location of recon slices.
  - RANGE REFERENCE: identifies an image containing overlay graphics indicating the area of a scan range.
  - ME<energy>KEV: Mono-Energetic Image
  - VNC: Virtual Non-Contrast Image
  - IOD: Iodine Enhancement Image
  - IMD: Iodine Concentration Image
  - MIX: mixed reconstructions out of two energy spectra
  - L: Image out of low energy
  - H: Image out of high energy
  - SPR: identifies Stopping Power Ratio (SPR) images
- Value 6 is specific to dual energy acquisitions. The following terms are defined:
  - DE_TB: split filter dual energy range.
  - DE_2SPI: dual spiral dual energy range.
  - DE_2SRC: dual source dual energy range
  - SNRG: Single energy
- Value 7 is specific to reconstruction of dual energy acquisitions. The following terms are defined:
  - MPR: Multi Planar Reconstruction image for mixed/Mono-energetic/VNC/Iodine reconstruction
  - MIP THIN: Maximum Intensity Projection image for mixed/Mono-energetic/VNC/Iodine reconstruction
  - CONVCT: Conventional CT image
  - PARALLEL: Range type for parallel ranges (for syngo Application Software)
  - RADIAL: Range type for radial ranges (for syngo Application Software)
  - CURVED: Range type for radial ranges (for syngo Application Software)

A.3.4.2 Image Type Values for Multi-Energy (Supplement 188)

- Value 4 identifies a Multi-Energy CT Image and is added after Value 3 of a Single-Energy CT Image. It is only present if Multi-energy CT Acquisition (0018,9361) has a value of YES [4](except for NAEOTOM Alpha.* where Value 4 is always added) (see also Value 4 of Single-Energy CT Images in A.3.4.1)
    - VMI identifies a Virtual Monoenergetic Image
    - MAT_SPECIFIC identifies a Material-Specific Image
    - MAT_REMOVED identifies a Material-Removed Image
    - THRESHOLD: identifies image at a specific energy threshold (see3)
    - ENERGY_PROP_WT: identifies fused image out of two energy spectra
    - LOW: identifies low energetic images
    - HIGH: identifies high energetic images
- Value 5 is implementation specific (see also Value 4 of Single-Energy CT Images in A.3.4)
    - CT_SOM10 DET3D: Threshold image
    - CT_SOM10 DEVNI: identifies VNI or Non-Iodine reconstructions out of two energy spectra
    - CT_SOM10 DEVNC: identifies VNC or Iodine reconstructions out of two energy spectraCT_SOM10 DEMEP: identifies Monoenergetic reconstructions out of two energy spectra
    - CT_SOM10 DEMIX: identifies mixed reconstructions out of two energy spectra
    - CT_SOM10 DEVCR: Vascular Calcium Removal image
    - CT_SOM10 DEQUAD: Quadruple
- Value 6 is implementation specific
    - ME<energy>KEV: Mono-Energetic Image
    - T1
    - PMON: Premonitoring Scan
    - MON:Monitoring Scan
    - MIX: mixed reconstructions out of two energy spectra
    - VNC: Virtual Non-Contrast Image
    - IOD: Iodine Enhancement Image
    - IMD: Iodine Concentration Image
    - VCR<energy>KEV
    - VNI<energy>KEV
    - L: Image out of low energy
    - H: Image out of high energy
- Value 7
    - COUNT: Single Source Counting
    - COUNT_2SRC: Dual Source Counting

[4] The system provides the option to switch on/off the support of the Supplement 188. The option has not to be switched off.

    - COUNT_2KVP
    - DE_2SRC: dual source dual energy range
    - DE_2SPI: dual spiral dual energy range.
- Value 8
    - MPR: Multi Planar Reconstruction image for mixed/Mono-energetic/VNC/Iodine reconstruction
    - CONVCT: Conventional CT image
    - MIP THIN: Maximum Intensity Projection image for mixed/Mono-energetic/VNC/Iodine reconstruction
    - SPP: Spectral Post-Processing data is included
- Value 9 (only if Value 8 is CONVCT)
    - MPR: Multi Planar Reconstruction image for mixed/Mono-energetic/VNC/Iodine reconstruction
    - MIP THIN: Maximum Intensity Projection image for mixed/Mono-energetic/VNC/Iodine reconstruction

In particular, THRESHOLD images reconstructed from the lowest threshold T1 use all photons detected at the detector.

Such images are also denoted as T3D images.

For some scan modes and reconstructions, e.g. UHR modes with sharp kernels, T3D images are the only available images.

A.3.4.3 Rescale Type Values

- HU used for Hounsfield Units
- Z_EFF used for Effective Atomic Number
- ED used for Electron Density
- EDW used for normalized Electron Density
- 100ug/cm3 used for Iodine Concentration images
- US used for LOCALIZER images

A.3.4.4 Rescale Type Values for Multi-Energy (Supplement 188)

- MGML used for Material density
- HU_MOD used for Modified Hounsfield Unit

A.4 Raw Data IOD

Note: The Raw data is used in two different ways:

- Raw Data is stored and handled in a proprietary format (containing a Raw Data header).
- “myAblation Guide” Raw Data: Regular usage of Raw Data UID (see [3])

Table A.4-1 IOD of created Raw Data SOP Class Instances

IE	Module Name	Presence (Module)	Condition	Reference
Patient	Patient	ALWAYS		Table A.1.1-1
Study	General Study	ALWAYS		Table A.1.1-2
	Patient Study	CONDITIONAL	Attributes of this module are not present in case of an unscheduled patient, or when not delivered by MWL.	Table A.1.1-3
Series	General Series	ALWAYS		Table A.4.1-1
Frame of Reference	Frame of Reference	CONDITIONAL	Required if time synchronization was applied.	Table A.1.1-6
Equipment	General Equipment	ALWAYS		Table A.1.1-4
Raw Data	Acquisition Context	ALWAYS		Table A.4.1-2
	Raw Data	ALWAYS		Table A.4.1-3
	SOP Common	ALWAYS		Table A.4.1-4
Private	General Equipment	ALWAYS		Table A.1.3-1
	Raw Data	ALWAYS		Table A.4.3-1
	Scan Range Data	ALWAYS		Table A.4.3-2

A.4.1 Raw Data IOD Specific Modules

Table A.4.1-1 General Series Module Attributes – Raw Data

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Modality	(0008,0060)	FIXED	ALWAYS	ALWAYS	CT		
Series Instance UID	(0020,000E)	GENERATED	ALWAYS	ALWAYS	1.3.12.2.1107.5.1.7. *+ serial number + part created per Series Instance*		
Series Number	(0020,0011)	GENERATED, SRC_INSTANCE	ALWAYS	ALWAYS	e.g: 603		Last 3 digit describes the series 6: Raw data
Series Date	(0008,0021)	GENERATED	ALWAYS	ALWAYS			
Series Time	(0008,0031)	GENERATED	ALWAYS	ALWAYS			
Protocol Name	(0018,1030)	USER	ALWAYS	ALWAYS			

Table A.4.1-2 Acquisition Context Module Attributes

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Acquisition Context Sequence	(0040,0555)	GENERATED	ALWAYS	EMPTY			

Table A.4.1-3 Raw Data Module Attributes

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Instance Number	(0020,0013)	GENERATED	ALWAYS	ALWAYS	*Number of image inside a series (started with 1)*		
Content Date	(0008,0023)	GENERATED	ALWAYS	ALWAYS			

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Content Time	(0008,0033)	GENERATED	ALWAYS	ALWAYS			
Creator-Version UID	(0008,9123)	GENERATED	ALWAYS	ALWAYS	1.3.12.2.1107.5.1.7. *+ serial number + part created per Raw Data Instance*		

Table A.4.1-4 SOP Common Module Attributes – Raw Data

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
SOP Class UID	(0008,0016)	FIXED	ALWAYS	ALWAYS	1.2.840.10008.5.1.4.1.1.66		
SOP Instance UID	(0008,0018)	GENERATED	ALWAYS	ALWAYS	1.3.12.2.1107.5.1.7. *+ serial number + part created per SOP Instance*		
Specific Character Set	(0008,0005)	MWL; GENERATED, CONFIGURATION	ALWAYS	ALWAYS			
Timezone Offset From UTC	(0008,0201)	GENERATED	ALWAYS	ALWAYS			

A.4.2 Raw Data IOD Functional Group Macros

N/A

A.4.3 Raw Data IOD Private Modules

Table A.4.3-1 Private Module Raw Data Attributes

Attribute Name	Tag	VR	VM	Identifiable Information	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Private Creator	(0029,00xx)	LO	1	SAFE	GENERATED	ALWAYS	ALWAYS	SIEMENS CT EXAM IMAGE		
Raw Data ID	(0029,xx2F)	LT	1	SAFE	GENERATED	*ALWAYS*	ALWAYS			
Private Creator	(0029,00xx)	LO	1	SAFE	GENERATED	ALWAYS	ALWAYS	SIEMENS CT EXAM RAWDATA		
Rawdata Description	(0029,xx01)	LO	1	SAFE	GENERATED	ALWAYS	ALWAYS			
Study instance UIDs	(0029,xx03)	UI	1	SAFE	GENERATED	ALWAYS	ALWAYS	1.3.12.2.1107.5.1.7. + *serial number + part created per Study Instance*		
Series instance UIDs	(0029,xx04)	UI	1	SAFE	GENERATED	ALWAYS	ALWAYS	1.3.12.2.1107.5.1.7. + *serial number + part created per Series Instance*		

Table A.4.3-2 Private Module Scan Range Data Attributes

Attribute Name	Tag	VR	VM	Identifiable Information	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Private Creator	(0029,00xx)	LO	1	SAFE	GENERATED	ALWAYS	ALWAYS	SIEMENS CT EXAM SCANRANGE DATA		
Horizontal Table Zero Position	(0029,xx01)	IS	1	SAFE	GENERATED	ALWAYS	ALWAYS			

A.4.4 Raw Data IOD Coded Values

N/A

A.5 Secondary Capture Image IOD

Table A.5-1 IOD of created Secondary Capture Image Storage SOP Class Instances

IE	Module Name	Presence (Module)	Condition	Reference
Patient	Patient	ALWAYS		Table A.1.1-1
Study	General Study	ALWAYS		Table A.1.1-2
	Patient Study	CONDITIONAL	Attributes of this module are not present in case of an unscheduled patient, or when not delivered by MWL.	Table A.1.1-3
Series	General Series	ALWAYS		Table A.5.1-1
General Reference	General Reference	ALWAYS		Table A.5.1-2
Equipment	General Equipment	ALWAYS		Table A.5.1-3
	SC Equipment	ALWAYS		Table A.5.1-4
Image	General Image	ALWAYS		Table A.5.1-5
	Image Pixel	ALWAYS		Table A.5.1-6
	SC Image	ALWAYS		Table A.5.1-7
	Overlay Plane	ALWAYS		Table A.5.1-8
	SOP Common	ALWAYS		Table A.5.1-9
Private	General Equipment	ALWAYS		Table A.1.3-1
	Cam 3D Data	CONDITIONAL	Present in case of a 3D image	Table A.5.3-1
	Dose Info	ALWAYS		Table A.5.3-2

A.5.1 Secondary Capture Image IOD Specific Modules

Table A.5.1-1 General Series Module Attributes – Secondary Capture

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Modality	(0008,0060)	GENERATED, CONFIGURATION	ALWAYS	ALWAYS	OT or XA or CT *(default = OT, can be configured) (Captured Projection Image) XA (Bookmarks)*		
Series Instance UID	(0020,000E)	GENERATED	ALWAYS	ALWAYS	1.3.12.2.1107.5.1.7. *+ serial number + part created per Series Instance*		
Series Number	(0020,0011)	GENERATED	ALWAYS	ALWAYS	e.g: 703		Last 3 digit describes the series 7: 3D camera images Topogram is described by 1 as the last digit
Series Date	(0008,0021)	GENERATED	ALWAYS	ALWAYS			
Series Time	(0008,0031)	GENERATED	ALWAYS	ALWAYS			
Protocol Name	(0018,1030)	USER, SRC_INSTANCE	ALWAYS	ALWAYS			
Series Description	(0008,103E)	GENERATED	ALWAYS	ALWAYS	e.g. eDDensity, Artifical120		Artificial120: The resulting image values are proportional to the attenuation coefficient for a defined 120 kVp-

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
							like spectrum. eDDensity: Image values are proportional to electron density. (Electron density variant of DirectDensity)

Table A.5.1-2 General Reference Module Attributes - Secondary Capture Image

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Referenced Image Sequence	(0008,1140)	GENERATED	ALWAYS	ALWAYS			
>Referenced SOP Class UID	(0008,1150)	FIXED	ALWAYS	ALWAYS	1.2.840.10008.5.1.4.1.1.2		
>Referenced SOP Instance UID	(0008, 1155)	GENERATED	ALWAYS	ALWAYS	1.3.12.2.1107.5.1.7. *+ serial number + part created per SOP Instance*		
Derivation Description	(0008,2111)	FIXED	CONDITIONAL	ALWAYS	Secondary Capture	If derived from single image	
Derivation Code Sequence	(0008,9215)	GENERATED	CONDITIONAL	ALWAYS		If derived from single image	
>>Code Value	(0008,0100)	MWL	ALWAYS	ALWAYS	1113074		
>>Coding Scheme Designator	(0008,0102)	MWL	ALWAYS	ALWAYS	DCM		
>>Code Meaning	(0008,0104)	MWL	ALWAYS	ALWAYS	Volume Rendering		
Source Image Sequence	(0008,2112)	GENERATED	CONDITIONAL	ALWAYS		If derived from single image	

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
> Referenced SOP Class UID	(0008,1150)	FIXED	ALWAYS	ALWAYS	1.2.840.10008.5.1.4.1.1.2		
> Referenced SOP Instance UID	(0008,1155)	GENERATED	ALWAYS	ALWAYS	1.3.12.2.1107.5.1.7. *+ serial number + part created per SOP Instance*		

Table A.5.1-3 General Equipment Module Attributes – Secondary Capture Image

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Manufacturer	(0008,0070)	FIXED	ALWAYS	ALWAYS	Siemens Healthineers		
Institution Name	(0008,0080)	CONFIGURATION	ALWAYS	ALWAYS	*from WS Configuration*		
Institution Address	(0008,0081)	CONFIGURATION	ALWAYS	ALWAYS	*from WS Configuration*		
Station Name	(0008,1010)	CONFIGURATION	ALWAYS	ALWAYS	*from WS Configuration*		
Institutional Department Name	(0008,1040)	CONFIGURATION	ALWAYS	ALWAYS	*from WS Configuration*		
Manufacturer's Model Name	(0008,1090)	FIXED	ALWAYS	ALWAYS	SOMATOM X.cite; SOMATOM X.ceed; syngo_Application_SW_SYS		Value depends on the used product
Device Serial Number	(0018,1000)	FIXED	ALWAYS	ALWAYS			
Software Versions	(0018,1020)	FIXED	ALWAYS	ALWAYS	syngo CT VB20A		
Spatial Resolution	(0018,1050)	GENERATED	ALWAYS	ALWAYS			
Pixel Padding Value	(0028,0120)	GENERATED	CONDITIONAL	ALWAYS	0 *for MONOCHROME2*	Not present for Secondary Capture Object "Patient Protocol"	

Table A.5.1-4 SC Equipment Module Attributes

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Conversion Type	(0008,0064)	FIXED	ALWAYS	ALWAYS	"WSD		
Modality	(0008,0060)	GENERATED, CONFIGURATION	ALWAYS	ALWAYS	OT or XA or CT *(default = OT, can be configured) (Captured Projection Image) XA (Bookmarks)*		
Secondary Capture Device ID	(0018,1010)	GENERATED	CONDITIONAL	ALWAYS		Not present for Secondary Capture Object "Patient Protocol"	
Secondary Capture Device Manufacturer	(0018,1016)	SRC_INSTANCE	ALWAYS	ALWAYS	Siemens Healthineers		
Secondary Capture Device Manufacturer's Model Name	(0018,1018)	SRC_INSTANCE	CONDITIONAL	ALWAYS	*Copied from (0008,1090)*	Not present for Secondary Capture Object "Patient Protocol"	
Secondary Capture Device Software Versions	(0018,1019)	CONFIGURATION	ALWAYS	ALWAYS	*from WS Configuration*		

Table A.5.1-5 General Image Module Attributes – Secondary Capture Image

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Instance Number	(0020,0013)	GENERATED	ALWAYS	ALWAYS	*Number of image inside a series (started with 1)*		
Patient Orientation	(0020,0020)	SRC_INSTANCE,	ALWAYS	ALWAYS	*From original (derived from single image) or*		

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
		GENERATED			*calculated or <zero length> (Derived from multiple images)*		
Content Date	(0008,0023)	GENERATED	ALWAYS	ALWAYS			
Content Time	(0008,0033)	GENERATED	ALWAYS	ALWAYS			
Image Type	(0008,0008)	GENERATED	ALWAYS	ALWAYS	*See Image Type Values A.5.4.1*		
Image Comments	(0020,4000)	GENERATED, USER	ALWAYS	ALWAYS	*Description, i.e.* automatic Result , ME 70keV/FAT, FatMap automatic Result , VNC/IOD , Virtual Unenhanced		
Burned in Annotation	(0028,0301)	GENERATED	ALWAYS	ALWAYS	NO		
Lossy Image Compression	(0028,2110)	GENERATED	ALWAYS	ALWAYS	"00 = uncompressed 01 = compressed		

Table A.5.1-6 Image Pixel Module Attributes – Secondary Capture Image

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Samples per Pixel	(0028,0002)	FIXED	ALWAYS	ALWAYS	1 *(grayscale image)* 3 *(RGB images)*		
Photometric Interpretation	(0028,0004)	FIXED	ALWAYS	ALWAYS	MONOCHROME2 *(grayscale image)* RGB *(RGB images)*		
Rows	(0028,0010)	FIXED	ALWAYS	ALWAYS	512		
Columns	(0028,0011)	FIXED	ALWAYS	ALWAYS	512		

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Bits Allocated	(0028,0100)	FIXED	ALWAYS	ALWAYS	16 *(grayscale image)* 8 *(RGB images)*		
Bits Stored	(0028,0101)	FIXED	ALWAYS	ALWAYS	12 *(grayscale image)* 8 *(RGB images)*		
High Bit	(0028,0102)	FIXED	ALWAYS	ALWAYS	11 *(grayscale image)* 7 *(RGB images)*		
Pixel Representation	(0028,0103)	FIXED	ALWAYS	ALWAYS	0000H		
Planar Configuration	(0028,0006)	FIXED	CONDITIONAL	ALWAYS	0	If Samples per pixel > 1	
Pixel Data	(7FE0,0010)	GENERATED	ALWAYS	ALWAYS			Type OB for MONOCHROME and RGB images

Table A.5.1-7 SC Image Module Attributes

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Date of Secondary Capture	(0018,1012)	GENERATED	ALWAYS	ALWAYS	*The date the Secondary Capture Image was captured.*		
Time of Secondary Capture	(0018,1014)	GENERATED	ALWAYS	ALWAYS	*The time the Secondary Capture Image was captured.*		
Pixel Spacing	(0028,0030)	GENERATED	CONDITIONAL	ALWAYS		Not present for Secondary Capture Object "Patient Protocol"	
Pixel Spacing Calibration Type	(0028,0A02)	SRC_INSTANCE	CONDITIONAL	ALWAYS	*From Original*	Not present for Secondary Capture	

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
						Object "Patient Protocol"	
Pixel Spacing Calibration Description	(0028,0A04)	SRC_INSTANCE	CONDITIONAL	ALWAYS	*From Original*	Not present for Secondary Capture Object "Patient Protocol"	

Table A.5.1-8 Overlay Plane Module Attributes – Secondary Capture Image

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Overlay Rows	(6000,0010)	FIXED	ALWAYS	ALWAYS	512		
Overlay Columns	(6000,0011)	FIXED	ALWAYS	ALWAYS	512		
Overlay Type	(6000,0040)	FIXED	ALWAYS	ALWAYS	G		
Overlay Origin	(6000,0050)	FIXED	ALWAYS	ALWAYS	1\1		
Image Frame Origin	(6000,0051)	FIXED	ALWAYS	ALWAYS	1		Even though not part of the Overlay Plane Module, this attribute is adopted here as a temporary workaround.
Overlay Bits Allocated	(6000,0100)	FIXED	ALWAYS	ALWAYS	1		
Overlay Bit Position	(60xx,0102)	FIXED	ALWAYS	ALWAYS	0		
Overlay Data	(6000,3000)	GENERATED	ALWAYS	ALWAYS			
Number of Frames in Overlay	(60xx,0015)	FIXED	ALWAYS	ALWAYS	1		Even though not part of the Overlay Plane Module, this attribute is

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
							adopted here as a temporary workaround.

Table A.5.1-9 SOP Common Module Attributes – Secondary Capture Image

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Instance Creation Date	(0008,0012)	GENERATED	ALWAYS	ALWAYS			
Instance Creation Time	(0008,0013)	GENERATED	ALWAYS	ALWAYS			
SOP Class UID	(0008,0016)	FIXED	ALWAYS	ALWAYS	1.2.840.10008.5.1.4.1.1.7		
SOP Instance UID	(0008,0018)	GENERATED	ALWAYS	ALWAYS	1.3.12.2.1107.5.1.7. + *serial number + part created per SOP Instance*		
Specific Character Set	(0008,0005)	MWL; GENERATED, CONFIGURATION	ALWAYS	ALWAYS			
Timezone Offset From UTC	(0008,0201)	GENERATED	ALWAYS	ALWAYS			
Contributing Equipment Sequence	(0018,A001)	GENERATED	CONDITIONAL	ALWAYS		Not present for Secondary Capture Object "Patient Protocol"	
>Purpose of Reference Code Sequence	(0040,A170)	GENERATED	ALWAYS	ALWAYS			
>>Code Value	(0008,0100)	GENERATED	ALWAYS	ALWAYS	109102		
>>Coding Scheme Designator	(0008,0102)	GENERATED	ALWAYS	ALWAYS	DCM		

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
>>Code Meaning	(0008,0104)	GENERATED	ALWAYS	ALWAYS	Processing Equipment		
>Manufacturer	(0008,0070)	FIXED	ALWAYS	ALWAYS	Siemens Healthineers		
>Institution Name	(0008,0080)	CONFIGURATION	ALWAYS	ALWAYS	*from WS configuration*		
>Institution Address	(0008,0081)	CONFIGURATION	ALWAYS	ALWAYS			
>Station Name	(0008,1010)	CONFIGURATION	ALWAYS	ALWAYS			
>Institutional Department Name	(0008,1040)	CONFIGURATION	ALWAYS	ALWAYS			
>Manufacturer's Model Name	(0008,1090)	FIXED	ALWAYS	ALWAYS	SOMATOM X.cite; SOMATOM X.ceed; syngo_Application_SW_SYS		Value depends on the used product
>Device Serial Number	(0018,1000)	GENERATED	ALWAYS	ALWAYS			
> Software Versions	(0018,1020)	FIXED	ALWAYS	ALWAYS	syngo CT VB20A		
Instance Number	(0020,0013)	GENERATED	ALWAYS	ALWAYS	*Number of image inside a series (started with 1)*		

A.5.2 Secondary Capture Image IOD Functional Group Macros

N/A

A.5.3 Secondary Capture Image IOD Private Modules

Table A.5.3-1 Private Module Cam 3D Data Attributes

Attribute Name	Tag	VR	VM	Identifiable Information	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Private Creator	(0019,00xx)	LO	1	SAFE	GENERATED	CONDITIONAL	ALWAYS	SIEMENS CT EXAM CAM3D	Only in case image type (0008,0008) is CT_SOM 3DCAM	
Cam3D Data	(0019,xx01)	OB	1	SAFE	GENERATED	CONDITIONAL	ALWAYS		Only in case image type (0008,0008) is CT_SOM 3DCAM	

Table A.5.3-2 Private Module Dose Info Attributes

Attribute Name	Tag	VR	VM	Identifiable Information	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Private Creator	(0019,00xx)	LO	1	SAFE	GENERATED	ALWAYS	ALWAYS	SIEMENS CT DOSE		
Dose Info	(0019,xx11)	OB	1	SAFE	GENERATED	ALWAYS	ALWAYS			

A.5.4 Secondary Capture Image IOD Coded Values

A.5.4.1 N/AImage Type Values of Captures Projection Images

- Value 1 identifies the Pixel Data Characteristics; Enumerated Values for the Pixel Data Characteristics are:
  - DERIVED: Identifies a Derived Image
- Value 2 identifies the Patient Examination Characteristics; Enumerated Values for the Patient Examination Characteristics are:
  - SECONDARY: Identifies a Secondary Image
- Value 3 identifies any Image IOD-specific specialization. The following terms are defined in addition to the DICOM standard definitions:

  - OTHER: Converted non-Axial and non-Localizer CT images
  - AXIAL in this context means any cross-sectional image, and includes transverse, coronal, sagittal and oblique images.
- Value 4 is implementation specific:
  - IAE_PRJ
  - MPR_FUSION
  - CT_SOM PROT (in case of Secondary Capture Object "Patient Protocol")
  - CT_SOM 3DCAM (in case of Secondary Capture Object "3D camera image")
- Value 5 identifies the filter type
  - MPR: identifies Multi Planar Reconstruction images
  - MPR_CV: identifies Multi Planar Reconstruction (curved cut) images
  - MIP: identifies Maximum Intensity Projection images
  - MIP_CV: identifies Maximum Intensity Projection (curved cut) images
  - MINIP: identifies Maximum Intensity Projection images
  - PARALLEL
  - OVERVIEW
  - IMAGE
  - VRT

A.5.4.1 Image Type Values of Bookmarks

- DERIVED\SECONDARY\OTHER\IAE_BOOKMARK

A.6 X-Ray Radiation Dose Report IOD

Table A.6-1 IOD of created X-Ray Radiation Dose Report SOP Instances

IE	Module Name	Presence (Module)	Condition	Reference
Patient	Patient	ALWAYS		Table A.1.1-1
Study	General Study	ALWAYS		Table A.1.1-2
	Patient Study	CONDITIONAL	Attributes of this module are not present in case of an unscheduled patient, or when not delivered by MWL.	Table A.1.1-3
Series	SR Document Series	ALWAYS		Table A.1.1-9
Equipment	General Equipment	ALWAYS		Table A.1.1-4

IE	Module Name	Presence (Module)	Condition	Reference
	Enhanced General Equipment	ALWAYS		Table A.1.1-8
SR Document	SR Document General	ALWAYS		Table A.1.1-10
	SR Document Content	ALWAYS		Table A.6.1-2
	SOP Common	ALWAYS		Table A.6.1-3
Private	General Equipment	ALWAYS		Table A.1.3-1

A.6.1 X-Ray Radiation Dose Report IOD Specific Modules

Table A.6.1-2 SR Document Content Module Attributes – X-Ray Radiation Dose SR

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Value Type	(0040,A040)	FIXED	ALWAYS	ALWAYS	CONTAINER		
Concept Name Code Sequence	(0040,A043)	GENERATED	ALWAYS	ALWAYS			
> Code Value	(0008,0100)	FIXED	ALWAYS	ALWAYS	113701		
> Coding Scheme Designator	(0008,0102)	FIXED	ALWAYS	ALWAYS	DCM		
> Code Meaning	(0008,0104)	FIXED	ALWAYS	ALWAYS	X-Ray Radiation Dose Report		
Continuity of Content	(0040,A050)	FIXED	ALWAYS	ALWAYS	SEPERATE		
Content Template Sequence	(0040,A504)	GENERATED	ALWAYS	ALWAYS			
>Mapping Resource	(0008,0105)	FIXED	ALWAYS	ALWAYS	DCMR		
>Template Identifier	(0040,DB00)	FIXED	ALWAYS	ALWAYS	10011		
Content Sequence	(0040,A730)	GENERATED	ALWAYS	ALWAYS	See Table B.1-1		

Table A.6.1-3 SOP Common Module Attributes – X-Ray Radiation Dose SR

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
SOP Class UID	(0008,0016)	FIXED	ALWAYS	ALWAYS	1.2.840.10008.5.1.4.1.1.88.67		
SOP Instance UID	(0008,0018)	GENERATED	ALWAYS	ALWAYS	1.3.12.2.1107.5.1.7. *+ serial number + part created per SOP Instance*		
Specific Character Set	(0008,0005)	MWL; GENERATED, CONFIGURATION	ALWAYS	ALWAYS			
Timezone Offset From UTC	(0008,0201)	GENERATED	ALWAYS	ALWAYS			

A.6.2 X-Ray Radiation Dose Report IOD Functional Group Macros

N/A

A.6.1 X-Ray Radiation Dose Report IOD Private Modules

N/A

A.6.2 X-Ray Radiation Dose Report IOD Coded Values

N/A

A.7 Enhanced SR IOD

Table A.7-1 IOD of created Enhanced SR SOP Instances

IE	Module Name	Presence (Module)	Condition	Reference
Patient	Patient	ALWAYS		Table A.1.1-1
Study	General Study	ALWAYS		Table A.1.1-2
Series	SR Document Series	ALWAYS		Table A.7.1-5
Equipment	General Equipment	ALWAYS		Table A.7.1-2
SR Document	SR Document General	ALWAYS		Table A.7.1-3
	SR Document Content	ALWAYS		Table A.7.1-4
	SOP Common	ALWAYS		Table A.7.1-6
Private	General Eqipment	ALWAYS		Table A.1.3-1

A.7.1 Enhanced SR IOD Specific Modules

Table A.7.1-2 General Equipment Module Attributes – Enhanced SR

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Manufacturer	(0008,0070)	FIXED	ALWAYS	ALWAYS	Siemens Healthineers		
Institution Name	(0008,0080)	CONFIGURATION	ALWAYS	ALWAYS	*from WS Configuration*		
Institution Address	(0008,0081)	CONFIGURATION	ALWAYS	ALWAYS	*from WS Configuration*		
Station Name	(0008,1010)	CONFIGURATION	ALWAYS	ALWAYS	*from WS Configuration*		
Institutional Department Name	(0008,1040)	CONFIGURATION	ALWAYS	ALWAYS	*from WS Configuration*		
Manufacturer's Model Name	(0008,1090)	FIXED	ALWAYS	ALWAYS	SOMATOM X.cite; SOMATOM X.ceed;		Value depends on the used product

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Device Serial Number	(0018,1000)	FIXED	ALWAYS	ALWAYS			
Software Versions	(0018,1020)	FIXED	ALWAYS	ALWAYS	syngo CT VB20A		
Date of Last Calibration	(0018,1200)	GENERATED	ALWAYS	ALWAYS			
Time of Last Calibration	(0018,1201)	GENERATED	ALWAYS	ALWAYS			

Table A.7.1-3 SR Document General Module Attributes - Enhanced SR

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Instance Number	(0020,0013)	FIXED	ALWAYS	ALWAYS	*Number of image inside a series*		
Completion Flag	(0040,A491)	FIXED	ALWAYS	ALWAYS	COMPLETE		
Verification Flag	(0040,A493)	FIXED	ALWAYS	ALWAYS	UNVERIFIED		
Content Date	(0008,0023)	GENERATED	ALWAYS	ALWAYS			
Content Time	(0008,0033)	GENERATED	ALWAYS	ALWAYS			
Referenced Request Sequence	(0040,A370)	GENERATED	ALWAYS	ALWAYS			
> Referenced SOP Class UID	(0008,1150)	FIXED	ALWAYS	ALWAYS	1.2.840.10008.3.1.2.3.3		
> Referenced SOP Instance UID	(0008,1155)	GENERATED	ALWAYS	ALWAYS	1.3.12.2.1107.5.1.7. + serial number + part created per SOP Instance		

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Identical Documents Sequence	(0040,A525)	GENERATED	CONDITIONAL	ALWAYS		Only in case of Multi-Study	
> Referenced Series Sequence	(0008,1115)	GENERATED	ALWAYS	ALWAYS			
>> Referenced SOP Sequence	(0008,1199)	GENERATED	ALWAYS	ALWAYS			
>>> Referenced SOP Class UID	(0008,1150)	FIXED	ALWAYS	ALWAYS	1.2.840.10008.3.1.2.3.3		
>>> Referenced SOP Instance UID	(0008,1155)	GENERATED	ALWAYS	ALWAYS	1.3.12.2.1107.5.1.7. + serial number + part created per SOP Instance		
>> Series Instance UID	(0020,000D)	GENERATED	ALWAYS	ALWAYS			
Study Instance UID	(0020,0000)	GENERATED	ALWAYS	ALWAYS			

Table A.7.1-4 SR Document Content Module Attributes - Enhanced SR

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Value Type	(0040,A040)	FIXED	ALWAYS	ALWAYS	CONTAINER		
Concept Name Code Sequence	(0040,A043)	GENERATED	ALWAYS	ALWAYS			
>Code Value	(0008,0100)	FIXED	ALWAYS	ALWAYS	1		
>Coding Scheme Designator	(0008,0102)	FIXED	ALWAYS	ALWAYS	99CT_SOMX		
>Code Meaning	(0008,0104)	FIXED	ALWAYS	ALWAYS	CT Examination Report		

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Continuity of Content	(0040,A050)	FIXED	ALWAYS	ALWAYS	SEPARATE		
Content Template Sequence	(0040,A504)	GENERATED	ALWAYS	ALWAYS			
>Mapping Resource	(0008,0105)	FIXED	ALWAYS	ALWAYS	99CT_SOMX		
>Template Identifier	(0040,DB00)	GENERATED	ALWAYS	ALWAYS	EXAMREPOR”		
Content Sequence	(0040,A730)	GENERATED	ALWAYS	ALWAYS	See Table B.3-1		

Table A.7.1-5 SR Document Series Module Attributes – Enhanced SR

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Modality	(0008,0060)	FIXED	ALWAYS	ALWAYS	SR		
Series Instance UID	(0020,000E)	GENERATED	ALWAYS	ALWAYS	1.3.12.2.1107.5.1.7. *+ serial number + part created per Series Instance*		
Series Number	(0020,0011)	GENERATED	ALWAYS	ALWAYS	e.g: 503		Last 3 digit describes the series e.g. 5: reports
Series Date	(0008,0021)	GENERATED	ALWAYS	ALWAYS			
Series Time	(0008,0031)	GENERATED	ALWAYS	ALWAYS			
Protocol Name	(0008,1030)	GENERATED	ALWAYS	ALWAYS			
Series Description	(0008,103E)	GENERATED	ALWAYS	ALWAYS			
Referenced Performed	(0008,1111)	GENERATED	CONDITONAL	ALWAYS			

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Procedure Step Sequence							
> Referenced SOP Class UID	(0008,1150)	FIXED	ALWAYS	ALWAYS	1.2.840.10008.3.1.2.3.3 1.3.12.2.1107.5.1.7. + serial number + part created per SOP Instance		
> Referenced SOP Instance UID	(0008,1155)	GENERATED	ALWAYS	ALWAYS			

Table A.7.1-6 SOP Common Module Attributes – Enhanced SR

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
SOP Class UID	(0008,0016)	FIXED	ALWAYS	ALWAYS	1.2.840.10008.5.1.4.1.1.88.22		
SOP Instance UID	(0008,0018)	GENERATED	ALWAYS	ALWAYS			
Specific Character Set	(0008,0005)	MWL; GENERATED, CONFIGURATION	ALWAYS	ALWAYS			
Coding Scheme Identification Sequence	(0008,0110)	GENERATED	ALWAYS	ALWAYS			
>Coding Scheme Designator	(0008,0102)	FIXED	ALWAYS	ALWAYS	99CT_SOMX		
>Coding Scheme Responsible Organization	(0008,0116)	FIXED	ALWAYS	ALWAYS	Siemens Healthineers		
>Coding Scheme Name	(0008,0115)	FIXED	ALWAYS	ALWAYS	CT Structured Report Content for Somaris/10		
Timezone Offset From UTC	(0008,0201)	GENERATED	ALWAYS	ALWAYS			

A.7.2 Enhanced SR IOD Functional Group Macros

N/A

A.7.3 Enhanced SR IOD Private Modules

N/A

A.7.4 Enhanced SR IOD Coded Values

N/A

A.8 Comprehensive SR IOD

Table A.8-1 IOD of created Comprehensive SR SOP Class Instances

IE	Module Name	Presence (Module)	Condition	Reference
Patient	Patient	ALWAYS		Table A.8.1-1
Study	General Study	ALWAYS		Table A.1.1-2
Series	SR Document Series	ALWAYS		Table A.8.1-4
Equipment	General Equipment	ALWAYS		Table A.8.1-3
SR Document	SR Document General	ALWAYS		Table A.1.1-10
	SR Document Content	ALWAYS		Table A.8.1-5
	SOP Common	ALWAYS		Table A.8.1-6

A.8.1 Comprehensive SR IOD Specific Modules

Table A.8.1-1 Patient Module Attributes - Comprehensive Module

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Patient´s Name	(0010,0010)	MWL; USER; GENERATED	ALWAYS	ALWAYS			
Patient ID	(0010,0020)	MWL; USER; GENERATED	ALWAYS	ALWAYS			
Patient´s Birth Date	(0010,0030)	MWL; USER; GENERATED	ALWAYS	ALWAYS			
Patient´s Sex	(0010,0040)	MWL; USER; GENERATED	ALWAYS	ALWAYS			

Table A.8.1-2 Patient Study Module Attributes - Comprehensive SR

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Admitting Diagnoses Description	(0008,1080)	MWL; GENERATED	ALWAYS	EMPTY			
Patient's Age	(0010,1010)	MWL; USER; GENERATED	ALWAYS	ALWAYS			
Patient's Size	(0010,1020)	MWL; USER	ALWAYS	CONDITIONAL		In case of intervention ranges	
Patient's Weight	(0010,1030)	MWL; USER	ALWAYS	CONDITIONAL		In case of intervention ranges	

Table A.8.1-3 General Equipment Module Attributes - Comprehensive SR

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Manufacturer	(0008,0070)	FIXED	ALWAYS	ALWAYS	Siemens Healthineers		

Table A.8.1-4 SR Document Series Module Attributes - Comprehensive SR

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Modality	(0008,0060)	FIXED	ALWAYS	ALWAYS	SR		
Series Instance UID	(0020,000E)	GENERATED	ALWAYS	ALWAYS	1.3.12.2.1107.5.1.7. *+ serial number + part created per Series Instance*		
Series Number	(0020,0011)	GENERATED	ALWAYS	ALWAYS	e.g: 503		Last 3 digit describes the series e.g.

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
							5: reports
Series Date	(0008,0021)	GENERATED	ALWAYS	ALWAYS			
Protocol Name	(0018,1030)	GENERATED	ALWAYS	ALWAYS			
Series Description	(0008,103E)	GENERATED	ALWAYS	ALWAYS			
Referenced Performed Procedure Step Sequence	(0008,1111)	GENERATED	ALWAYS	ALWAYS			
> Referenced SOP Class UID	(0008,1150)	FIXED	ALWAYS	ALWAYS	1.2.840.10008.3.1.2.3.3		
> Referenced SOP Instance UID	(0008,1155)	GENERATED	ALWAYS	ALWAYS	1.3.12.2.1107.5.1.7. + serial number + part created per SOP Instance		

Table A.8.1-5 SR Document Content Module Attributes - Comprehensive Module

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Value Type	(0040,A040)	FIXED	ALWAYS	ALWAYS	CONTAINER		
Continuity of Content	(0040,A050)	FIXED	ALWAYS	ALWAYS	SEPARATE		
Concept Name Code Sequence	(0040,A043)	GENERATED	ALWAYS	ALWAYS			
> Code Value	(0008,0100)	FIXED	ALWAYS	ALWAYS	126000		
> Coding Scheme Designator	(0008,0102)	FIXED	ALWAYS	ALWAYS	DCM		

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
> Code Meaning	(0008,0104)	FIXED	ALWAYS	ALWAYS	Imaging Measurement Report		
Content Sequence	(0040,A730)	GENERATED	ALWAYS	ALWAYS			

Table A.8.1-6 SOP Common Module Attributes - Comprehensive Module

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
SOP Class UID	(0008,0016)	FIXED	ALWAYS	ALWAYS	1.2.840.10008.5.1.4.1.1.88.33		
SOP Instance UID	(0008,0018)	GENERATED	ALWAYS	ALWAYS	1.3.12.2.1107.5.1.7. *+ serial number + part created per SOP Instance*		
Specific Character Set	(0008,0005)	MWL; GENERATED, CONFIGURED	ALWAYS	ALWAYS			

A.8.2 Comprehensive SR IOD Functional Group Macros

N/A

A.8.3 Comprehensive SR IOD Private Modules

N/A

A.8.4 Comprehensive SR IOD Coded Values

N/A

A.9 Spatial Registration IOD

Table A.9-1 IOD of created Spatial Registration SOP Instances

IE	Module Name	Presence (Module)	Condition	Reference
Patient	Patient	ALWAYS		Table A.1.1-1
Study	General Study	ALWAYS		Table A.1.1-2
	Patient Study	CONDITIONAL	Attributes of this module are not present in case of an unscheduled patient, or when not delivered by MWL.	Table A.1.1-3
Series	General Series	ALWAYS		Table A.9.1-1
	Spatial Registration Series	ALWAYS		
Frame Of Reference	Frame of Reference	ALWAYS		Table A.9.1-2
Equipment	General Equipment	ALWAYS		Table A.1.1-4
Spatial Registration	Spatial Registration	ALWAYS		Table A.9.1-4
	Common Instance Reference	ALWAYS		Table A.1.1-12
	SOP Common	ALWAYS		Table A.9.1-5

A.9.1 Spatial Registration IOD Specific Modules

Table A.9.1-1 General Series Module Attributes – Spatial Registration

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Modality	(0008,0060)	FIXED	ALWAYS	ALWAYS	REG		
Series Instance UID	(0020,000E)	GENERATED	ALWAYS	ALWAYS	1.3.12.2.1107.5.1.7. *+ serial number + part created per Series Instance*		
Series Number	(0020,0011)	GENERATED	ALWAYS	ALWAYS			

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Laterality	(0020,0060)	GENERATED	CONDITIONAL	EMPTY		only available if the body part examined is a paired structure	Arms and legs are paired structure, head not
Series Date	(0008,0021)	GENERATED	ALWAYS	ALWAYS			
Series Time	(0008,0031)	GENERATED	ALWAYS	ALWAYS			
Protocol Name	(0018,1030)	GENERATED	ALWAYS	ALWAYS	Fusion3D3D		
Series Number	(0020,0011)	FIXED	ALWAYS	ALWAYS	960		
Series Description	(0008,103E)	GENERATED	ALWAYS	ALWAYS	Fusion3D3D		

Table A.9.1-2 Spatial Registration Series Module Attributes

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Modality	(0008,0060)	FIXED	ALWAYS	ALWAYS	REG		

Table A.9.1-3 Frame of Reference Module Attributes – Spatial Registration

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Frame of Reference UID	(0020,0052)	SRC_INSTANCE	ALWAYS	ALWAYS			Copied from object to which the registration result applies.
Position Reference Indicator	(0020,1040)	SRC_COPY	ALWAYS	CONDITIONAL		If available in original	If applicable, copied from original image (volume in registered space) to

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
							which the registration result applies.

Table A.9.1-4 Spatial Registration Module Attributes

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Content Label	(0070,0080)	GENERATED	ALWAYS	ALWAYS	<YYYYMMDDHHMM>_REG		
Content Description	(0070,0081)	GENERATED, USER	ALWAYS	ALWAYS			
Content Creator's Name	(0070,0084)	GENERATED	ALWAYS	ALWAYS	3D3Dregistration		
Registration Sequence	(0070,0308)	GENERATED	ALWAYS	ALWAYS	*Two items, one "identity transformation" for the volume in the registered space, to which the volume specified in the second item, is registered to.*		
>Referenced Image Sequence	(0008,1140)	GENERATED	CONDITIONAL	ALWAYS	*Reference to the volume in the registered space*	In case Frame of Reference UID is not sufficient to refer to volume	
>Frame of Reference UID	(0020,0052)	GENERATED	ALWAYS	ALWAYS	*FoR of volume in the registered space*		
>Matrix Registration Sequence	(0070,0309)	GENERATED	ALWAYS	ALWAYS			
>>Matrix Sequence	(0070,030A)	GENERATED	ALWAYS	ALWAYS			
>>>Frame of Reference Trans-	(0070,030C)	GENERATED	ALWAYS	ALWAYS			

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
formation Matrix Type							
>>>Frame of Reference Transformation Matrix	(3006,00C6)	GENERATED	ALWAYS	ALWAYS	"identity transformation" specified.		
>>Registration Type Code Sequence	(0070,030D)	GENERATED	ALWAYS	ALWAYS	(125021, DCM, Frame of Reference Identity)		

Table A.9.1-5 SOP Common Module Attributes – Spatial Registration

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Instance Creation Date	(0008,0012)	GENERATED	ALWAYS	ALWAYS			
Instance Creation Time	(0008,0013)	GENERATED	ALWAYS	ALWAYS			
SOP Class UID	(0008,0016)	FIXED	ALWAYS	ALWAYS	1.2.840.10008.5.1.4.1.1.66.1		
SOP Instance UID	(0008,0018)	GENERATED	ALWAYS	ALWAYS	1.3.12.2.1107.5.1.7. *+ serial number + part created per SOP Instance*		
Specific Character Set	(0008,0005)	MWL; GENERATED, CONFIGURATION	ALWAYS	ALWAYS			

A.9.2 Spatial Registration IOD Functional Group Macros

N/A

A.9.3 Spatial Registration IOD Private Modules

N/A

A.9.4 Spatial Registration IOD Coded Values

N/A

A.10 Surface Segmentation IOD

Table A.10-1 IOD of created Surface Segmentation Storage SOP Class Instances

IE	Module Name	Presence (Module)	Condition	Reference
Patient	Patient	ALWAYS		Table A.1.1-1
Study	General Study	ALWAYS		Table A.1.1-2
Series	General Series	ALWAYS		Table A.10.1-1
	Segmentation Series	ALWAYS		Table A.10.1-
Frame of Reference	Frame of Reference	ALWAYS		Table A.1.1-6
Equipment	General Equipment	ALWAYS		Table A.1.1-4
	Enhanced General Equipment	ALWAYS		Table A.1.1-8
Segmentation	Surface Segmentation	ALWAYS		Table A.10.1-3
	Surface Mesh	ALWAYS		Table A.10.1-4
	Common Instance Reference	ALWAYS		Table A.10.1-5
	SOP Common	ALWAYS		Table A.10.1-6

A.10.1 Surface Segmentation IOD Specific Modules

Table A.10.1-1 General Series Module Attributes – Surface Segmentation

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Modality	(0008,0060)	FIXED	ALWAYS	ALWAYS	SEG		
Series Instance UID	(0020,000E)	GENERATED	ALWAYS	ALWAYS	1.3.12.2.1107.5.1.7. *+ serial number + part created per Series Instance*		
Series Number	(0020,0011)	GENERATED, SRC_INSTANCE	ALWAYS	ALWAYS			

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Series Date	(0008,0021)	GENERATED	ALWAYS	ALWAYS			
Series Time	(0008,0031)	GENERATED	ALWAYS	ALWAYS			

Table A.10.1-2 Segmentation Series Module Attributes

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Modality	(0008,0060)	FIXED	ALWAYS	ALWAYS	SEG		
Series Number	(0020,0011)	GENERATED	CONDITIONAL	ALWAYS		In case of derived objects depending on the availability in the source.	
Referenced Performed Procedure Step Sequence	(0008,1111)	GENERATED	CONDITIONAL	ALWAYS		In case of derived objects depending on the availability in the source.	
> Referenced SOP Class UID	(0008,1150)	FIXED	ALWAYS	ALWAYS	1.2.840.10008.3.1.2.3.3		
> Referenced SOP Instance UID	(0008,1155)	GENERATED	ALWAYS	ALWAYS	1.3.12.2.1107.5.1.7. + serial number + part created per SOP Instance		

Table A.10.1-3 Surface Segmentation Module Attributes

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Segment Sequence	(0062,0002)	GENERATED	ALWAYS	ALWAYS			

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
> Segment Number	(0062,0004)	GENERATED	ALWAYS	ALWAYS			
> Segment Label	(0062,0005)	GENERATED	ALWAYS	ALWAYS	*Unique name for the needle in the format* "<UniqueID> <Name>"		
> Segment Algorithm Type	(0062,0008)	GENERATED	ALWAYS	ALWAYS			
> Segmented Property Category Code Sequence	(0062,0003)	GENERATED	ALWAYS	ALWAYS			
>> Code Value	(0008,0100)	FIXED	ALWAYS	ALWAYS			
>> Coding Scheme Designator	(0008,0102)	FIXED	ALWAYS	ALWAYS			
>> Code Meaning	(0008,0104)	FIXED	ALWAYS	ALWAYS			
> Surface Count	(0066,002A)	GENERATED	ALWAYS	ALWAYS	> 0		
> Segmented Property Type Code Sequence	(0062,000F)	GENERATED	ALWAYS	ALWAYS			
>> Code Value	(0008,0100)	FIXED	ALWAYS	ALWAYS			
>> Coding Scheme Designator	(0008,0102)	FIXED	ALWAYS	ALWAYS			
>> Code Meaning	(0008,0104)	FIXED	ALWAYS	ALWAYS			
> Referenced Surface Sequence	(0066,002B)	GENERATED	ALWAYS	ALWAYS			
>> Referenced Surface Number	(0066,002C)	GENERATED	ALWAYS	ALWAYS			
>> Segment Surface Generation	(0066,002D)	GENERATED	ALWAYS	ALWAYS			

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Algorithm Identification Sequence							
>>> Algorithm Family Code Sequence	(0066,002F)	GENERATED	ALWAYS	ALWAYS			
>>>> Code Value	(0008,0100)	FIXED	ALWAYS	ALWAYS			
>>>> Coding Scheme Designator	(0008,0102)	FIXED	ALWAYS	ALWAYS			
>>>> Code Meaning	(0008,0104)	FIXED	ALWAYS	ALWAYS			
>>> Algorithm Version	(0066,0031)	GENERATED	ALWAYS	ALWAYS			
>>> Algorithm Name	(0066,0036)	FIXED	ALWAYS	ALWAYS	NeedleGuidance		
>> Segment Surface Source Instance Sequence	(0066,002E)	GENERATED	ALWAYS	ALWAYS			
>>> Referenced SOP Class UID	(0008,1150)	SRC_INSTANCE	ALWAYS	ALWAYS			*Copied from original image's SOP Class UID*
>>> Referenced SOP Instance UID	(0008,1155)	SRC_INSTANCE	ALWAYS	ALWAYS			*Copied from original image's SOP Instance UID*
Content Label	(0070,0080)	GENERATED	ALWAYS	ALWAYS			
Content Description	(0070,0081)	GENERATED	ALWAYS	EMPTY			
Content's Creator Name	(0070,0084)	GENERATED	ALWAYS	EMPTY			

Table A.10.1-4 Surface Mesh Module Attributes

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Number Of Surfaces	(0066,0001)	GENERATED	ALWAYS	ALWAYS			
Surface Sequence	(0066,0002)	GENERATED	ALWAYS	ALWAYS			
>Recommended Display Grayscale Value	(0062,000C)	GENERATED	ALWAYS	ALWAYS			
>Recommended Display CIELab Value	(0062,000D)	GENERATED	ALWAYS	ALWAYS			
>Surface Number	(0066,0003)	GENERATED	ALWAYS	ALWAYS			
>Surface Comments	(0066,0004)	FIXED	ALWAYS	ALWAYS	needle geometry		
>Surface Processing	(0066,0009)	GENERATED	ALWAYS	EMPTY			
>Recommended Presentation Opacity	(0066,000C)	GENERATED	ALWAYS	ALWAYS	1.0		
>Recommended Presentation Type	(0066,000D)	FIXED	ALWAYS	ALWAYS	WIREFRAME		
>Finite Volume	(0066,000E)	GENERATED	ALWAYS	ALWAYS			
>Manifold	(0066,0010)	GENERATED	ALWAYS	ALWAYS			
>Surface Points Sequence	(0066,0011)	GENERATED	ALWAYS	ALWAYS			
>>Number Of Surface Points	(0066,0015)	GENERATED	ALWAYS	ALWAYS			
>>Point Coordinates Data	(0066,0016)	GENERATED	ALWAYS	ALWAYS			
>Surface Points Normals Sequence	(0066,0012)	GENERATED	ALWAYS	EMPTY			

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
>> Number of Vectors	(0066,001E)	GENERATED	ALWAYS	ALWAYS			
>> Vector Dimensionality	(0066,001F)	GENERATED	ALWAYS	ALWAYS			
>> Vector Cooridnate Data	(0066,001E)	GENERATED	ALWAYS	ALWAYS			
>Surface Mesh Primitives Sequence	(0066,00)	GENERATED	ALWAYS	ALWAYS			
>>Line Sequence	(0066,0028)	GENERATED	ALWAYS	ALWAYS			
>>>Long Primitive Point Index List	(0066,0040)	GENERATED	ALWAYS	ALWAYS			

Table A.10.1-5 Common Instance Reference Module Attributes

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value		Conditions	Comments
Referenced Series Sequence	(0008,1115)	GENERATED	CONDITIONAL	ALWAYS			Needed if one or more references to series and instances in the same study have to be done. Otherwise use (0008,1200). It is mandatory to reference the Volume Image and optional to reference a DICOM	

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value		Conditions	Comments
							Segmentation object	
>Referenced Instance Sequence	(0008,114A)	GENERATED	ALWAYS	ALWAYS				
>>Referenced SOP Class UID	(0008, 1150)	GENERATED	ALWAYS	ALWAYS				
>>Referenced SOP Instance UID	(0008,1155)	GENERATED	ALWAYS	ALWAYS				
>Series Instance UID	(0020,000E)	GENERATED	ALWAYS	ALWAYS	1.3.12.2.1107.5.1.7. *+ serial number + part created per Series Instance*			
Studies Containing Other Referenced Instances Sequence	(0008,1200)	GENERATED	CONDITIONAL	ALWAYS			Needed if one or more references to series and instances in another study have to be done. Otherwise use (0008,1115). It is mandatory to reference the Volume Image and optional to reference a DICOM Segmentation object	
> Referenced Series Sequence	(0008,1115)	GENERATED	ALWAYS	ALWAYS				

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value		Conditions	Comments
>> Referenced Instance Sequence	(0008,114A)	GENERATED	ALWAYS	ALWAYS				
>>>Referenced SOP Class UID	(0008, 1150)	GENERATED	ALWAYS	ALWAYS				
>>>Referenced SOP Instance UID	(0008,1155)	GENERATED	ALWAYS	ALWAYS				
>> Series Instance UID	(0020,000E)	GENERATED	ALWAYS	ALWAYS	1.3.12.2.1107.5.1.7. *+ serial number + part created per Series Instance*			
>Study Instance UID	(0020,000D)	GENERATED	ALWAYS	ALWAYS				

Table A.10.1-6 SOP Common Module Attributes – Surface Segmentation

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
SOP Class UID	(0008,0016)	FIXED	ALWAYS	ALWAYS			
SOP Instance UID	(0008,0018)	GENERATED	ALWAYS	ALWAYS			
Specific Character Set	(0008,0005)	MWL, GENERATED, CONFIGURATION	ALWAYS	ALWAYS			

A.10.2 Surface Segmentation IOD Functional Group Macros

N/A

A.10.3 Surface Segmentation IOD Private

Table A.10.3-7 Private Module Surface Segmentation Extension Attributes

Attribute Name	Tag	VR	VM	Identi-fiable Infor-mation	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
Private Creator	(0067,00xx)	LO	1	SAFE	GENERATED	ALWAYS	ALWAYS	SIEMENS SMS-AX Surface Segmentation Extension		
SSO Version Number	(0067,xx04)	US	1	SAFE	GENERATED	ALWAYS	ALWAYS			
SSO Owner	(0067,xx40)	LO	1	SAFE	GENERATED	ALWAYS	ALWAYS			
SSO GUID	(0067,xx44)	LO	1	SAFE	GENERATED	ALWAYS	ALWAYS			
Group Sequence	(0067,xx47)	SQ	1	SAFE	GENERATED	ALWAYS	ALWAYS			
> Group GUID	(0067,xx43)	LO	1	SAFE	GENERATED	ALWAYS	ALWAYS			
> Group Name	(0067,xx49)	LO	1	SAFE	GENERATED	ALWAYS	ALWAYS			
Private Surface Segmentation Sequence	(0067,xx48)	SQ	1	SAFE	GENERATED	ALWAYS	ALWAYS			
> Object Type	(0067,xx00)	CS	1	SAFE	FIXED	ALWAYS	ALWAYS	NEEDLE		
> Object Version Number	(0067,xx39)	US	1	SAFE	GENERATED	ALWAYS	ALWAYS			
> Object GUID	(0067,xx42)	LO	1	SAFE	GENERATED	ALWAYS	ALWAYS			
> Referenced Group GUID	(0067,xx51)	LO	1	SAFE	GENERATED	ALWAYS	ALWAYS			

A.10.4 Surface Segmentation IOD Coded Values

N/A

Annex B Structured Report Content Encoding

This Section provides the detailed content encoding for all TIDs supported by syngo CT.

Throughout the tables listed in Annex B the following values are used for the “Source” and “Presence of Content Item” columns.

In the “Source” column, the following values can be used:

- FIXED: The value is pre-defined and cannot be modified.
- GENERATED: The value is generated by the system.
- CONFIGURATION: The value is copied from system configuration.
- MWL: The value is copied from Modality Worklist entry.
- QUERY: The value is determined by performing a query of any of the supported Query/Retrieve Services.
- USER: The value is entered by the user.
- SCANNED: The value is read from a barcode scanner or similar device.
- EMPTY: The value is empty.
- SRC_INSTANCE: The value is copied from previously created/received SOP Instances.

In the “Presence of Content Item” the following values can be used:

- ALWAYS: the module, functional group macro, Attributes or value is always present.
- CONDITIONAL: the presence of the module, functional group macro, Attributes or value is dependent on a condition. The condition must be listed in the “Comments” column.
- SRC_COPY: The presence of the Attributes and values depends on the availability of these in the source Instances, which are used for copying this information.
- EMPTY: The Attribute is present but without a value (zero length).

B.1 CT Radiation Dose (TID 10011)

Table B.1-1 CT Radiation Dose (TID 10011)

NL	Rel with Parent	VT	Concept Name	Source	Presence of Content Item	Values	TID	Comments
		CONTAINER	(113701, DCM, "Xray Radiation Dose Report")	FIXED	ALWAYS		10011	Root node
>	HAS CONCEPT MOD	CODE	(121058, DCM, "Procedure reported")	GENERATED	ALWAYS	(77477000,SCT," Computerized axial tomography")	10011	
>>	HAS CONCEPT MOD	CODE	(G-C0E8, SRT, "Has Intent")	GENERATED	ALWAYS	(261004008,SCT ,"Diagnostic Intent")	10011	
>	HAS OBS CONTEXT	CODE	(121005, DCM, "Observer Type")	FIXED	ALWAYS	(121007,DCM,"D evice")	1002	
>	HAS OBS CONTEXT	UIDREF	(121012, DCM, "Device Observer UID")	GENERATED	ALWAYS	1.3.12.2.1107.5. 1.7. *+ serial number*	1004	
>	HAS OBS CONTEXT	TEXT	(121013, DCM, "Device Observer Name")	GENERATED	ALWAYS	*Name of syngo Acquistion Workplace*	1004	
>	HAS OBS CONTEXT	TEXT	(121014, DCM, "Device Observer Manufacturer")	FIXED	ALWAYS	Siemens Healthineers	1004	
>	HAS OBS CONTEXT	TEXT	(121015, DCM, "Device Observer Model Name")	GENERATED	ALWAYS	*Scanner model*	1004	
>	HAS OBS CONTEXT	TEXT	(121016, DCM, "Device Observer Serial Number")	GENERATED	ALWAYS	*Individual serial number*	1004	

NL	Rel with Parent	VT	Concept Name	Source	Presence of Content Item	Values	TID	Comments
>	HAS OBS CONTEXT	TEXT	(121017, DCM, "Device Observer Physical Location During Observation")	GENERATED	ALWAYS		1004	
>	HAS OBS CONTEXT	DATETIME	(113809, DCM, "Start of X-ray Irradiation")	GENERATED	ALWAYS	*First Acquisition Date/Time in study*	10011	
>	HAS OBS CONTEXT	DATETIME	(113810, DCM, "End of X-ray Irradiation")	GENERATED	ALWAYS	*Last Acquisition Date/Time in study*	10011	
>	HAS OBS CONTEXT	CODE	(113705, DCM, "Scope of Accumulation")	GENERATED	ALWAYS	(113014,DCM,"Study")'	10011	
>>	HAS PROPERTIES	UIDREF	(10001) UID	GENERATED	ALWAYS		10001	
>	CONTAINS	CONTAINER	(10012) CT Accumulated Dose Data	FIXED	ALWAYS		10012	
>>	CONTAINS	NUM	(113812, DCM, "Total Number of Irradiation Events")	GENERATED	ALWAYS		10012	
>>	CONTAINS	NUM	(113813, DCM, "CT Dose Length Product Total")	GENERATED	ALWAYS		10012	
>	CONTAINS	CONTAINER	(113819, DCM, "CT Acquisition")	FIXED	ALWAYS			
>>	CONTAINS	TEXT	(125203, DCM, "Acquisition Protocol")	GENERATED	ALWAYS	*Name of the Range*	10013	

NL	Rel with Parent	VT	Concept Name	Source	Presence of Content Item	Values	TID	Comments
>>	CONTAINS	CODE	(123014 , DCM, "Target Region")	USER	ALWAYS	(12738006,SCT," *Brain*")	10013	
>>	CONTAINS	CODE	(113820, DCM, "CT Acquisition Type")	GENERATED	ALWAYS	(113805,DCM,"C *onstant Angle Acquisition*")	10013	
>>	CONTAINS	CODE	(G-C232, SRT, "Procedure Context")	GENERATED	ALWAYS	8399331006,SCT ,"*CT without contrast*")	10013	
>>	CONTAINS	UIDREF	(113769, DCM, "Irradiation Event UID")	GENERATED	ALWAYS		10013	
>>	CONTAINS	CONTAINER	(113822, DCM, "CT Acquisition Parameters")	FIXED	ALWAYS		10013	
>>>	CONTAINS	NUM	(113824, DCM, "Exposure Time")	GENERATED	ALWAYS		10013	
>>>	CONTAINS	NUM	(113825, DCM, "Scanning Length")	USER	ALWAYS		10014	
>>>	CONTAINS	NUM	(113893, DCM, "Length of Reconstructable Volume")	USER	ALWAYS		10014	
>>>	CONTAINS	NUM	(113899, DCM, "Exposed Range")	GENERATED	ALWAYS		10014	
>>>	CONTAINS	NUM	(113895, DCM, "Top Z Location of Reconstructable Volume")	GENERATED	ALWAYS		10014	

NL	Rel with Parent	VT	Concept Name	Source	Presence of Content Item	Values	TID	Comments
>>>	CONTAINS	NUM	(113896, DCM, "Bottom Z Location of Reconstructable Volume")	GENERATED	ALWAYS		10014	
>>>	CONTAINS	NUM	(113897, DCM, "Top Z Location of Scanning Length")	GENERATED	ALWAYS		10014	
>>>	CONTAINS	NUM	(113898, DCM, "Bottom Z Location of Scanning Length")	GENERATED	ALWAYS		10014	
>>>	CONTAINS	UIDREF	(112227, DCM, "Frame of Reference UID")	GENERATED	ALWAYS		10014	
>>>	CONTAINS	NUM	(113827, DCM, “Nominal Total Collimation Width”)	GENERATED	ALWAYS		10013	
>>>	CONTAINS	NUM	(113826, DCM, “Nominal Single Collimation Width”)	GENERATED	ALWAYS		10013	
>>>	CONTAINS	NUM	(113828, DCM, “Pitch Factor”)	USER	CONDITIONAL		10013	Present only for spiral and zigzag ranges

NL	Rel with Parent	VT	Concept Name	Source	Presence of Content Item	Values	TID	Comments
>>>	CONTAINS	NUM	(113823, DCM, "Number of X-ray Sources")		ALWAYS		10013	
>>>	CONTAINS	CONTAINER	(113831, DCM, "CT X-ray Source Parameters")	FIXED	ALWAYS		10013	
>>>>	CONTAINS	TEXT	(113832, DCM, "Identification Number of the X-ray Source")	GENERATED	ALWAYS		10013	
>>>>	CONTAINS	NUM	(113733, DCM, "KVP")	GENERATED	ALWAYS		10013	
>>>>	CONTAINS	NUM	(113833, DCM, "Maximum X-ray Tube Current")	GENERATED	ALWAYS		10013	
>>>>	CONTAINS	NUM	(113734, DCM, "X-ray Tube Current"	USER	ALWAYS		10013	
>>>>	CONTAINS	NUM	(113834, DCM, "Exposure Time per Rotation")	GENERATED	CONDITIONAL		10013	Present only for tomograms
>>	CONTAINS	CONTAINER	(113829, DCM, "CT Dose")	FIXED	ALWAYS		10013	
>>>	CONTAINS	NUM	(113830, DCM, "Mean CTDIvol ")	GENERATED	ALWAYS		10013	
>>>	CONTAINS	CODE	(113835, DCM, "CTDIw Phantom Type")	FIXED	ALWAYS	(113690,DCM,"*IEC Head Dosimetry Phantom*")	10013	

NL	Rel with Parent	VT	Concept Name	Source	Presence of Content Item	Values	TID	Comments
>>>	CONTAINS	NUM	(113838, DCM, "DLP")	GENERATED	ALWAYS		10013	
>>>	CONTAINS	NUM	(113930, DCM, "Size Specific Dose Estimate")	GENERATED	CONDITIONAL		10013	Present only if tomogram was scanned
>>>>	HAS CONCEPT MOD	CODE	(370129005, SCT, "Measurement Method")	FIXED	ALWAYS	(113989,DCM,"*Arithmetic Average of SSDE(z)*")	10013	
>>>>	CONTAINS	NUM	(113980, DCM, "Water Equivalent Diameter")	GENERATED	ALWAYS		10013	
>>>>>	HAS CONCEPT MOD	CODE	(370129005, SCT, "Measurement Method")	FIXED	ALWAYS	(113984,DCM,"*Water Equivalent Diameter From Localizer*")	10013	
>>>>	INFERRED FROM	NUM	(113993, DCM, "Size Specific Dose Estimate At Longitudinal Position Z")	GENERATED	ALWAYS		10013	
>>>>>	INFERRED FROM	NUM	(113994, DCM, "Longitudinal Position Z")	GENERATED	ALWAYS		10013	
>>>>>	INFERRED FROM	NUM	(113995, DCM, "Water Equivalent Diameter At Longitudinal Position Z")	GENERATED	ALWAYS		10013	

NL	Rel with Parent	VT	Concept Name	Source	Presence of Content Item	Values	TID	Comments
>>>	CONTAINS	CONTAINER	(113900, DCM, "Dose Check Alert Details")	FIXED	ALWAYS		10015	
>>>>	CONTAINS	CODE	(113901, DCM, "DLP Alert Value Configured")	CONFIGURATION ; USER	ALWAYS	(373067005,SCT ,*"No"*) (373066001,SCT ,"Yes")	10015	Default no
>>>>	CONTAINS	CODE	(113902, DCM, "CTDIvol Alert Value Configured")	CONFIGURATION	ALWAYS	(373067005,SCT ,*"No"*) (373066001,SCT ,"Yes")	10015	
>>>>	CONTAINS	NUM	(113903, DCM, "DLP Alert Value")	GENERATED, USER	CONDITIONAL		10015	Present only if DLP Alert is configured
>>>>	CONTAINS	NUM	(113904, DCM, "CTDIvol Alert Value")	GENERATED, USER	ALWAYS	1000mg *by default*	10015	Present only if CTDIvol Alert is configured
>>>>	CONTAINS	NUM	(113905, DCM, "Accumulated DLP Forward Estimate")	GENERATED	ALWAYS		10015	
>>>>	CONTAINS	NUM	(113906, DCM, "Accumulated CTDIvol Forward Estimate")	GENERATED	ALWAYS		10015	
>>>>	CONTAINS	TEXT	(113907, DCM, "Reason for Proceeding")	USER	ALWAYS		10015	
>>>>>	CONTAINS	PNAME	(113870, DCM, "Person Name")	GENERATED	ALWAYS		1020	

NL	Rel with Parent	VT	Concept Name	Source	Presence of Content Item	Values	TID	Comments
>>>>>	HAS PROPERTIES	CODE	(113875, DCM, "Person Role in Procedure")	GENERATED	ALWAYS		1020	
>>>	CONTAINS	CONTAINER	(113908, DCM, "Dose Check Notification Details")	FIXED	CONDITIONAL		10015	*Only if Dose Notification is configured*
>>>>	CONTAINS	CODE	(113909, DCM, "DLP Notification Value Configured")	CONFIGURATION ;USER	ALWAYS	(373067005,SCT ,"*No*") (373066001,SCT ,"Yes")	10015	Default no
>>>>	CONTAINS	CODE	(113910, DCM, "CTDIvol Notification Value Configured")	CONFIGURATION ;USER	ALWAYS	(373067005,SCT ,"*No*") (373066001,SCT ,"Yes")	10015	Default no
>>>>	CONTAINS	NUM	(113911, DCM, "DLP Notification Value")	USER	CONDITONAL		10015	Present only if DLP Notification is configured
>>>>	CONTAINS	NUM	113912, DCM, "CTDIvol Notification Value")	USER	CONDITIONAL		10015	Present only if CTDIvol Notifcation is configured
>>>>	CONTAINS	NUM	113913, DCM, "DLP Forward Estimate")	GENERATED	ALWAYS		10015	
>>>>	CONTAINS	NUM	113914, DCM, "CTDIvol Forward Estimate")	GENERATED	ALWAYS		10015	

NL	Rel with Parent	VT	Concept Name	Source	Presence of Content Item	Values	TID	Comments
>>>>	CONTAINS	TEXT	(113907, DCM, "Reason for Proceeding")	USER	ALWAYS		10015	
>>>>>	CONTAINS	PNAME	(113870, DCM, "Person Name")	GENERATED	ALWAYS		1020	
>>>>>	HAS PROPERTIES	CODE	113875, DCM, "Person Role in Procedure")	GENERATED	ALWAYS		1020	

B.2 Measurement Report (TID 1500)

Table B.2-1 Measurement Report (TID 1500)

NL	Rel with Parent	VT	Concept Name	Source	Presence of Content Item	Values	TID	Comments
			Measurement Report		ALWAYS			
>	HAS OBS CONTEXT	CODE	EV (121005, DCM, "Observer Type")		ALWAYS	Device	1002	
>	HAS OBS CONTEXT	INCLUDE	DTID 1004 “Device Observer Identifying Attributes”	GENERATED	ALWAYS		1004	
>>		UIDREF	(121012, DCM, "Device Observer UID")	GENERATED	ALWAYS		1004	

NL	Rel with Parent	VT	Concept Name	Source	Presence of Content Item	Values	TID	Comments
>>		TEXT	(121014, DCM, "Device Observer Manufacturer")	FIXED	ALWAYS	Siemens Healthineers	1004	
>>		TEXT	(121015, DCM, "Device Observer Model Name")	FIXED	ALWAYS	SOMATOM X.cite; SOMATOM X.ceed;	1004	
>	CONTAINS	CONTAINER	(126010, DCM, "Imaging Measurements")	FIXED	ALWAYS			
ALWAYS>>	HAS OBS CONTEXT	TEXT	("112039", "DCM", " Tracking Identifier")	GENERATED	ALWAYS		1501	
>>	HAS OBS CONTEXT	UIDREF	("112040", "DCM", " Tracking Unique Identifier")	GENERATED	ALWAYS		1501	
>>	CONTAINS	CODE	("121071", "DCM", "Finding")	GENERATED	ALWAYS		1501	
>>	CONTAINS	CODE	("121291", "DCM", "Results Communicated"),	GENERATED	ALWAYS		1501	
>>	HAS CONCEPT MOD	CODE	("363698007", "SCT", "Finding Site")	GENERATED	ALWAYS		1501	
>>>	HAS CONCEPT MOD	CODE	("106233006", "SCT", "Topographical Modifier")	GENERATED	ALWAYS		1501	

B.3 CT Examination SR

Table B.3-1 CT Examination SR

NL	Rel with Parent	VT	Concept Name	Source	Presence of Content Item	Values	TID	Comments
		CONTAINER	(1, 99CT_SOMX, "CT Examination Report")	FIXED	ALWAYS			
>	CONTAINS	CONTAINER	(2, 99CT_SOMX, "CT Acquisition Report")	FIXED	ALWAYS			
>>	CONTAINS	NUM	(100, 99CT_SOMX, "Total mAs")	GENERATED	ALWAYS	UNITS = EV (mA.s, UCUM, "mA.s")		
>>	CONTAINS	TEXT	(102, 99CT_SOMX, "Performing Physician's Name")	MWL	CONDITIONAL			In case attribute is provided by MWL
>>	CONTAINS	TEXT	(103, 99CT_SOMX, "Operators Name")	MWL	CONDITIONAL			In case attribute is provided by MWL
>>	CONTAINS	NUM	(113813, DCM, "CT Dose Length Product Total")	GENERATED	ALWAYS	UNITS = EV (mGy.cm, UCUM, "mGy.cm")		
>>	CONTAINS	CONTAINER	(600, 99CT_SOMX, "Patient Position Attributes")	FIXED	ALWAYS			
>>>	CONTAINS	TEXT	(601, 99CT_SOMX, "Patient Position")	USER	ALWAYS			

NL	Rel with Parent	VT	Concept Name	Source	Presence of Content Item	Values	TID	Comments
>>>	CONTAINS	TEXT	(602, 99CT_SOMX, “Frame of reference id”)	GENERATED	ALWAYS			
>>	CONTAINS	CONTAINER	(550, 99CT_SOMX, “Contrast Phase”)	FIXED	CONDITIONAL			Only in case contrast phase is scanned
>>>	CONTAINS	TEXT	(121145, DCM, "Description of Material")	FIXED	ALWAYS	Contrast		
>>>	CONTAINS	NUM	(122091, DCM, "Volume administered")	USER	ALWAYS	UNITS = (ml, UCUM, "ml")		
>>>	CONTAINS	NUM	(122093, DCM, "Concentration")	USER	ALWAYS	UNITS = (mg/ml, UCUM, "mg/ml")		
>>>	CONTAINS	NUM	(122094, DCM, "Rate of administration")	USER	ALWAYS	UNITS = (ml/s, UCUM, "ml/s")		
>>>	CONTAINS	NUM	(300, 99CT_SOMX, “CM Ratio”)	USER	ALWAYS	UNITS = (%, UCUM, "%")		
>>>	CONTAINS	TEXT	(123011, DCM, "Contrast/Bolus Agent”)	USER	ALWAYS			
>>	CONTAINS	CONTAINER	(113819, DCM, “CT Acquisition”)	FIXED	ALWAYS			
>>>	CONTAINS	TEXT	(101, 99CT_SOMX, “Range Name”)	FIXED	ALWAYS			
>>>	CONTAINS	CONTAINER	(4, 99CT_SOMX, “Decision Tree”)	FIXED	ALWAYS			

NL	Rel with Parent	VT	Concept Name	Source	Presence of Content Item	Values	TID	Comments
>>>>	CONTAINS	TEXT	(803, 99CT_SOMX, “Comment”)	FIXED	CONDITIONAL	No decision tree selected,		In case no decision trees are used
>>>>	CONTAINS	CONTAINER	(5, 99CT_SOMX, “User”)	FIXED	CONDITIONAL			In case decision trees are used
>>>>>	CONTAINS	CONTAINER	(800, 99CT_SOMX, “Attribute”)	CONFIGURED	ALWAYS			
>>>>>>	CONTAINS	TEXT	EV(801, 99CT_SOMX, “Question”)	CONFIGURED	ALWAYS			
>>>>>>	CONTAINS	TEXT	(802, 99CT_SOMX, “Answer”)	FIXED	ALWAYS			
>>>>	CONTAINS	CONTAINER	(6, 99CT_SOMX, “System”)	FIXED	CONDITIONAL			In case decision trees are used
>>>>>	CONTAINS	CONTAINER	(800, 99CT_SOMX, “Attribute”)	CONFIGURED	ALWAYS			
>>>>>>	CONTAINS	TEXT	(801, 99CT_SOMX, “Question”)	CONFIGURED	ALWAYS			
>>>>>>	CONTAINS	TEXT	(802, 99CT_SOMX, “Answer”)	CONFIGURED	ALWAYS			
>>>	CONTAINS	CONTAINER	(113822, DCM, “CT Acquisition Parameters”)	FIXED	ALWAYS			
>>>>	CONTAINS	NUM	(113824, DCM, "Exposure Time")	GENERATED	ALWAYS	UNITS = EV (s, UCUM, "s")		

NL	Rel with Parent	VT	Concept Name	Source	Presence of Content Item	Values	TID	Comments
>>>>	CONTAINS	NUM	(113826, DCM, "Nominal Single Collimation Width")	GENERATED	ALWAYS	UNITS = EV (mm, UCUM, "mm")		
>>>>	CONTAINS	NUM	(204, 99CT_SOMX , “Quality Reference mAs”)	CONDITIONAL	ALWAYS	UNITS = EV (mA.s, UCUM, "mA.s")		In case ranges are scanned
>>>>	CONTAINS	NUM	(205, 99CT_SOMX , “Quality Reference mAs Low”)	USER; GENERATED	CONDITIONAL	UNITS = EV (mA.s, UCUM, "mA.s")		In case DE ranges are scanned
>>>>	CONTAINS	NUM	(206, 99CT_SOMX , “Quality Reference mAs High”)	USER; GENERATED	CONDITIONAL	UNITS = EV (mA.s, UCUM, "mA.s")		In case DE ranges are scanned
>>>>	CONTAINS	NUM	(207, 99CT_SOMX , “Effective mAs”)	USER; GENERATED	ALWAYS	UNITS = EV (mA.s, UCUM, "mA.s")		
>>>>	CONTAINS	NUM	(208, 99CT_SOMX , “Effective mAs Low”)	USER; GENERATED	CONDITIONAL	UNITS = EV (mA.s, UCUM, "mA.s")		In case DE ranges are scanned
>>>>	CONTAINS	NUM	(209, 99CT_SOMX , “Effective mAs High”)	USER; GENERATED	CONDITIONAL	UNITS = EV (mA.s, UCUM, "mA.s")		In case DE ranges are scanned
>>>>	CONTAINS	NUM	(113830, DCM, "Mean CTDIvol")	GENERATED	ALWAYS	UNITS = EV (mGy, UCUM, "mGy")		

NL	Rel with Parent	VT	Concept Name	Source	Presence of Content Item	Values	TID	Comments
>>>>	CONTAINS	TEXT	(113835, DCM, "CTDIw Phantom Type")	FIXED	ALWAYS			
>>>>	CONTAINS	NUM	(113838, DCM, "DLP")	GENERATED	ALWAYS	UNITS = EV (mGy.cm, UCUM, "mGy.cm")		
>>>>	CONTAINS	NUM	(113930, DCM, "Size Specific Dose Estimate")	GENERATED	CONDITIONAL	UNITS = EV (mGy, UCUM, "mGy ")		In case tomograns are scanned
>>>>	CONTAINS	NUM	(113980, DCM, "Water Equivalent Diameter")	GENERATED	CONDITIONAL	UNITS = EV (cm, UCUM, "cm ")		In case tomograns are scanned
>>>>	CONTAINS	NUM	(113812, DCM, "Total Number of Irradiation events")	GENERATED	ALWAYS	UNITS = EV ({events},UCUM, "events")		
>>>>	CONTAINER	CONTAINER	(113831, DCM, "CT X-Ray Source Parameters")	FIXED	ALWAYS			
>>>>>	CONTAINS	NUM	(113733, DCM, "KVP")	GENERATED	ALWAYS	UNITS = EV (kV, UCUM, "kV")		
>>>>>	CONTAINS	NUM	(113734, DCM, "X-Ray Tube Current")	GENERATED	ALWAYS	UNITS = EV (mA, UCUM, "mA")		
>>>>>	CONTAINS	TEXT	(113832, DCM, "Identification of the X-Ray Source")	GENERATED	ALWAYS			
>>>>>	CONTAINS	TEXT	(201, 99CT_SOMX, “Tin Filter”)	GENERATED	ALWAYS	TRUE;FALSE		

NL	Rel with Parent	VT	Concept Name	Source	Presence of Content Item	Values	TID	Comments
>>>>>	CONTAINS	TEXT	(202, 99CT_SOMX, “Tube Type”)	GENERATED	ALWAYS	A, B		
>>>>>	CONTAINS	TEXT	(203, 99CT_SOMX, “Scan Number”)	GENERATED	ALWAYS			
>>>>>	CONTAINS	NUM	(113826, DCM, "Nominal Single Collimation Width")	GENERATED	ALWAYS	UNITS = EV (mm, UCUM, "mm")		
>>>>>	CONTAINS	TEXT	(106, 99CT_SOMX, "X-Ray Filter Material")	GENERATED	ALWAYS	None, Tin, GoldTin, Gold		
>>>>	CONTAINS	NUM	(107, 99CT_SOMX, “Effective Bolus Trigger Level”)	GENERATED	CONDITIONAL	UNITS = EV ([hnsf'U], UCUM, "Hounsfield Unit")		In case of a Bolus range
>>>>	CONTAINS	NUM	(108, 99CT_SOMX, “Reference Bolus Trigger Level”)	GENERATED	CONDITIONAL	UNITS = EV ([hnsf'U], UCUM, "Hounsfield Unit")		In case of a Bolus range
>>>>	CONTAINS	NUM	(109, 99CT_SOMX, “Intended Bolus Trigger Level”)	USER	CONDITIONAL	UNITS = EV ([hnsf'U], UCUM, "Hounsfield Unit")		In case of a Bolus range
>>>>	CONTAINS	CONTAINER	(110, 99CT_SOMX, “Enabled exposure pattern”)	USER	CONDITIONAL	*Absolute Time (+ Relative Time)*		In case of dynamic and zigzag scans

NL	Rel with Parent	VT	Concept Name	Source	Presence of Content Item	Values	TID	Comments
>>>>>	CONTAINS	TEXT	E(111, 99CT_SOMX, “Dynamic Scan Cycle Time”)	GENERATED	CONDITIONAL			In case of dynamic scans

Annex C Security Details

This Section provides additional details about security features that are formally described in Section 8.

C.1 External Network Requirement Details

C.1.1 Basic Time Synchronization

N/A

C.1.2 Basic Network Address Management

The Network API of the Operating System is responsible for the discovery of the DHCP Server. syngo CT is operable in a DHCP environment but must be equipped with a fixed IP address.

C.1.3 Application Configuration Management

Table C.1.3-1 defines the security patterns supported:

Table C.1.3-1 LDAP Security Patterns

Actor	LDAP Security Pattern	Supported	Comments
LDAP Client	TLS	Y	
	TLS-Manual	N	
	Basic	Y	
	Basic-Manual	N	
	Anonymous	N	
	Anonymous-Manual	N	
	[Additional pattern]	N	

C.1.4 DNS Service Discovery

The DNS Service is discovered based on the Network API and the Network Settings of the Operating System.

The DNS Service accessed via the Operating System is used for resolving host names to IP Addresses (for example during the configuration of a Remote Node).

C.2 DICOM Security Profile Details

C.2.1 Online Electronic Storage Secure Use

Remote Access is restricted on User Level. This is done on the Operating System level.

C.2.2 Audit Trail Messages

Table C.2.2-1 specifies the DICOM Audit Messages that syngo CT can detect and report. It defines the list of triggers that will cause the Audit Message to be generated if these triggers can be configured or not. It also specifies whether the content of the Audit Message can be configured or not.

Table C.2.2-1 DICOM Specific Audit Messages

Audit Message	Used	Supported Triggers	Configurable Triggers	Configurable Message	Comments
Application Activity	Y	Application Start Application Stop	N	N	
Audit Log Used	N		N	N	
Begin Transferring DICOM Instances	Y	Send	N	N	
Data Export	Y	Export	N	N	
Data Import	Y	Import	N	N	
DICOM Instance Accessed	Y	Update Delete	N	N	
DICOM Instance Transferred	Y	Receive	N	N	
DICOM Study Deleted	Y	Deleted	N	N	
Network Entry	N		N	N	
Query	Y	Query	N	N	
Security Alert	Y	Software Configuration Node Authentication Failed	N	N	
User Authentication	Y	Login Login Failed	N	N	
Order Record	N		N	N	
Patient Record	Y	Delete	N	N	
Procedure Record	N		N	N	
[Other Message]	Y	Study updated Study moved Series moved Series merge Series split Series copied	N	N	

Table C.2.2-2 specifies the implementation details of each audit message supported by this product.

Table C.2.2-2 Audit Message Details – Export

Real-World Entities	Field Name	Supported	Value Constraints
Application Activity Message			
Event	EventID	Y	EV (110106, DCM, "Export")
	EventActionCode	Y	R
	EventDateTime	Y	Current date and Time
	EventOutcomeIndicator	Y	0 – Success 4 – Minor Failure 8 – Serious Failure 12 – Major Failure
	EventTypeCode	N	
Active Participant (Remote Users and Processes)	UserID	Y	Provided by the Operating System
	AlternativeUserID	N	
	UserName	N	
	UserIsRequestor	Y	false
	RoleIDCode	Y	EV (110152, DCM, "Destination Role ID")
	NetworkAccessPointID	N	
	NetworkAccessPointTypeCode	N	
Active Participant (User or Process Exporting the Data)	UserID	Y	<platform_id>, <product_serial_number>
	AlternativeUserID	N	
	UserName	N	
	UserIsRequestor	Y	true
	RoleIDCode	Y	EV (110153, DCM, "Source Role ID")
	NetworkAccessPointTypeCode	Y	2
	NetworkAccessPointID	Y	The Machin Name
Active Participant (Media)	UserID	Y	Destination Directory
	AlternativeUserID	N	
	UserName	N	
	UserIsRequestor	Y	false
	RoleIDCode	Y	EV (110154, DCM, "Destination Media")
	NetworkAccessPointTypeCode	N	
	NetworkAccessPointID	N	
	MediaIdentifier	N	
	MediaType	N	
Audit Log Used Message			
Participating Object (Studies)	ParticipantObjectTypeCode	Y	2
	ParticipantObjectTypeCodeRole	Y	3
	ParticipantObjectDataLifeCycle	N	
	ParticipantObjectIDTypeCode	Y	EV (110180, DCM, "Study Instance UID")

Real-World Entities	Field Name	Supported	Value Constraints
	ParticipantObjectSensitivity	N	
	ParticipantObjectID	Y	The Study Instance UID
	ParticipantObjectName	N	
	ParticipantObjectQuery	N	
	ParticipantObjectDetail	N	
	ParticipantObjectDescription	N	
	SOP Class UID	Y	The SOP Class UID
	Accession Number	Y	“Value not set”
	NumberOfInstances	Y	The number of Instances exported
	Instances	N	
	Encrypted	N	
	Anonymized	Y	false
Participating Object (Patients)	ParticipantObjectTypeCode	Y	1
	ParticipantObjectTypeCodeRole	Y	1
	ParticipantObjectDataLifeCycle	N	
	ParticipantObjectIDTypeCode	Y	2
	ParticipantObjectSensitivity	N	
	ParticipantObjectID	Y	The Patient ID
	ParticipantObjectName	N	
	ParticipantObjectQuery	N	
	ParticipantObjectDetail	N	
	ParticipantObjectDescription	N	
Other messages			
AuditSourceIdentification	AuditEnterpriseSiteID	Y	Machine Name
	AuditSourceID	Y	<platform_id>, <product_serial_number>

Table C.2.2-3 Audit Message Details – Import

Real-World Entities	Field Name	Supported	Value Constraints
Application Activity Message			
Event	EventID	Y	EV (110107, DCM, "Import")
	EventActionCode	Y	C
	EventDateTime	Y	Current date and Time
	EventOutcomeIndicator	Y	0 – Success 4 – Minor Failure 8 – Serious Failure 12 – Major Failure
	EventTypeCode	N	
Active Participant (Users or Processes Importing the data)	UserID	Y	<platform_id>, <product_serial_number>
	AlternativeUserID	N	
	UserName	N	
	UserIsRequestor	Y	true
	RoleIDCode	Y	EV (110152, DCM, “Destination Role ID”)
	NetworkAccessPointTypeCode	Y	2
	NetworkAccessPointID	Y	The Machine Name
Active Participant (Source Media)	UserID	Y	The Source Folder
	AlternativeUserID	N	
	UserName	N	
	UserIsRequestor	Y	false
	RoleIDCode	Y	EV (110155, DCM, “Source Role ID”)
	NetworkAccessPointTypeCode	N	
	NetworkAccessPointTypeID	N	
	MediaIdenfifier	N	
	MediaType	N	
Active Participant (Source)	UserID	Y	The User ID as provided by the Operating System
	AlternativeUserID	N	
	UserName	N	
	UserIsRequestor	Y	false
	RoleIDCode	Y	EV (110153, DCM, "Source Role ID")
	NetworkAccessPointTypeCode	N	
	NetworkAccessPointID	N	
Audit Log Used Message			
Participating Object (Studies)	ParticipantObjectTypeCode	Y	2
	ParticipantObjectTypeCodeRole	Y	3
	ParticipantObjectDataLifeCycle	N	

Real-World Entities	Field Name	Supported	Value Constraints
	ParticipantObjectIDTypeCode	Y	EV (110180, DCM, “Study Instance UID”)
	ParticipantObjectSensitivity	N	
	ParticipantObjectID	Y	The Study Instance UID
	ParticipantObjectName	N	
	ParticipantObjectQuery	N	
	ParticipantObjectDetail	N	
	ParticipantObjectDescription	N	
	SOP Class UID	Y	The SOP Class UID
	Accession Number	Y	“Value not set”
	NumberOfInstances	Y	The Number of Instances imported
	Instances	N	
	Encrypted	N	
	Anonymized	N	
Participating Object (Patients)	ParticipantObjectTypeCode	Y	1
	ParticipantObjectTypeCodeRole	Y	1
	ParticipantObjectDataLifeCycle	N	
	ParticipantObjectIDTypeCode	Y	2
	ParticipantObjectSensitivity	N	
	ParticipantObjectID	Y	The Patient ID
	ParticipantObjectName	N	
	ParticipantObjectQuery	N	
	ParticipantObjectDetail	N	
	ParticipantObjectDescription	N	
Other Messages			
AuditSourceIdentification	AuditEnterpriseSiteID	Y	Machine Name
	AuditSourceID	Y	<platform_id>, <product_serial_number>

Table C.2.2-4 Audit Message Details – DICOM Instance Accessed

Real-World Entities	Field Name	Supported	Value Constraints
Application Activity Message			
Event	EventID	Y	EV (110103, DCM, "DICOM Instances Accessed")
	EventActionCode	Y	C – Create R – Read U – Update D – Delete
	EventDateTime	Y	Current date and Time
	EventOutcomeIndicator	Y	0 – Success 4 – Minor Failure 8 – Serious Failure 12 – Major Failure
	EventTypeCode	N	
Active Participant (Persons and or Programs manipulating the data)	UserID	Y	User or Process Identification provided by the Operating System
	AlternativeUserID	N	
	UserName	N	
	UserIsRequestor	Y	false
	RoleIDCode	N	
	NetworkAccessPointTypeCode	N	
	NetworkAccessPointID	N	
Audit Log Used Message			
Participating Objects (Studies)	ParticipantObjectTypeCode	Y	2
	ParticipantObjectTypeCodeRole	Y	3
	ParticipantObjectDataLifeCycle	N	
	ParticipantObjectIDTypeCode	Y	EV (110180, DCM, “Study Instance UID”)
	ParticipantObjectSensitivity	N	
	ParticipantObjectID	Y	The Study Instance UID
	ParticipantObjectName	N	
	ParticipantObjectQuery	N	
	ParticipantObjectDetail	N	
	ParticipantObjectDescription	N	
	SOP Class UID	Y	The SOP Class UID
	Accession Number	Y	“ “
	NumberOfInstances	N	
	Encrypted	N	
	Anonymized	N	
	ParticipantObjectTypeCode	Y	1

Real-World Entities	Field Name	Supported	Value Constraints
Participating Object (Patient)	ParticipantObjectTypeCodeRole	Y	1
	ParticipantObjectDataLifeCycle	N	
	ParticipantObjectIDTypeCode	Y	2
	ParticipantObjectSensitivity	N	
	ParticipantObjectID	Y	The Patient ID
	ParticipantObjectName	N	
	ParticipantObjectQuery	N	
	ParticipantObjectDetail	N	
	ParticipantObjectDescription	N	
Participating Object (User)	ParticipantObjectID	Y	User
	ParticipantObjectIDTypeCode	Y	EV (1, DCM, “”)
	Type	Y	UserDefinedText
	Value	Y	The encoded description of what happened
Other messages			
AuditSourceIdentification	AuditEnterpriseSiteID	Y	Machine Name
	AuditSourceID	Y	<platform_id>, <product_serial_number>

Table C.2.2-5 Audit Message Details – Begin Transferring DICOM Instances

Real-World Entities	Field Name	Supported	Value Constraints
Application Activity Message			
Event	EventID	Y	EV (110102, DCM, "Begin Transferring DICOM Instances")
	EventActionCode	Y	E
	EventDateTime	Y	Current date and Time
	EventOutcomeIndicator	Y	0 – Success 4 – Minor Failure 8 – Serious Failure 12 – Major Failure
	EventTypeCode	N	
Active Participant (Process sending the data)	UserID	Y	The Source Machine Name
	AlternativeUserID	N	
	UserName	N	
	UserIsRequestor	Y	false
	RoleIDCode	N	EV (110153, DCM, "Source Role ID")
	NetworkAccessPointTypeCode	N	2
	NetworkAccessPointID	N	The IP Address of the Source Machine
Active Participant (Process receiving the data)	UserID	Y	The Destination Machine Name
	AlternativeUserID	N	
	UserName	N	
	UserIsRequestor	Y	false
	RoleIDCode	Y	EV (110152, DCM, "Destination Role ID")
	NetworkAccessPointTypeCode	Y	2
	NetworkAccessPointID	Y	The IP Address of the Destination Machine
Active Participant (Other Participants)	UserID	Y	The User ID as provided by the Operating System
	AlternativeUserID	N	
	UserName	N	
	UserIsRequestor	Y	False
	RoleIDCode	N	
	NetworkAccessPointTypeCode	N	
	NetworkAccessPointID	N	
Audit Log Used Message			
Participating Objects (Studies being transferred)	ParticipantObjectTypeCode	Y	2
	ParticipantObjectTypeCodeRole	Y	3
	ParticipantObjectDataLifeCycle	N	
	ParticipantObjectIDTypeCode	Y	EV (110180, DCM, “Study Instance UID”)

Real-World Entities	Field Name	Supported	Value Constraints
	ParticipantObjectSensitivity	N	
	ParticipantObjectID	Y	The Study Instance UID
	ParticipantObjectName	N	
	ParticipantObjectQuery	N	
	ParticipantObjectDetail	N	
	ParticipantObjectDescription	N	
	SOP Class UID	Y	The SOP Class UID
	Accession Number	Y	" "
	NumberOfInstances	N	
	Encrypted	N	
	Anonymized	N	
Participating Object (Patient)	ParticipantObjectTypeCode	Y	1
	ParticipantObjectTypeCodeRole	Y	1
	ParticipantObjectDataLifeCycle	N	
	ParticipantObjectIDTypeCode	Y	2
	ParticipantObjectSensitivity	N	
	ParticipantObjectID	Y	The Patient ID
	ParticipantObjectName	N	
	ParticipantObjectQuery	N	
	ParticipantObjectDetail	N	
	ParticipantObjectDescription	N	
Other messages			
AuditSourceIdentification	AuditEnterpriseSiteID	Y	Machine Name
	AuditSourceID	Y	<platform_id>, <product_serial_number>

Please note: This is the Audit Log message generated in case of a DICOM Send on the sender side.

Table C.2.2-6 Audit Message Details –DICOM Instances Transferred

Real-World Entities	Field Name	Supported	Value Constraints
Application Activity Message			
Event	EventID	Y	EV (110104, DCM, "DICOM Instances Transferred")
	EventActionCode	Y	C – Create R – Read U – Update
	EventDateTime	Y	Current date and Time
	EventOutcomeIndicator	Y	0 – Success 4 – Minor Failure 8 – Serious Failure 12 – Major Failure
	EventTypeCode	N	
Active Participant (Process that sent the data)	UserID	Y	The Source Machine Name
	AlternativeUserID	N	
	UserName	N	
	UserIsRequestor	Y	False
	RoleIDCode	Y	EV (110153, DCM, "Source Role ID")
	NetworkAccessPointTypeCode	Y	2
	NetworkAccessPointID	Y	The IP Address of the Source Machine
Active Participant (Process that received the data)	UserID	Y	The Destination Machine Name
	AlternativeUserID	N	
	UserName	N	
	UserIsRequestor	Y	false
	RoleIDCode	Y	EV (110152, DCM, "Destination Role ID")
	NetworkAccessPointTypeCode	Y	2
	NetworkAccessPointID	Y	The IP Address of the Destination Machine
Active Participant (Other participants that are known, especially third parties that are the requestor)	UserID	Y	The ID of the receiving process
	AlternativeUserID	N	
	UserName	N	
	UserIsRequestor	Y	false
	RoleIDCode	N	
	NetworkAccessPointTypeCode	N	
	NetworkAccessPointID	N	
Audit Log Used Message			
Participating Objects (Studies being transferred)	ParticipantObjectTypeCode	Y	2
	ParticipantObjectTypeCodeRole	Y	3
	ParticipantObjectDataLifeCycle	N	

Real-World Entities	Field Name	Supported	Value Constraints
	ParticipantObjectIDTypeCode	Y	EV (110180, DCM, “Study Instance UID”)
	ParticipantObjectSensitivity	N	
	ParticipantObjectID	Y	The Study Instance UID
	ParticipantObjectName	N	
	ParticipantObjectQuery	N	
	ParticipantObjectDetail	N	
	ParticipantObjectDescription	N	
	SOP Class UID	Y	The SOP Class UID
	Accession Number	Y	“Value not set”
	NumberOfInstances	Y	The number of Instances transferred
	Encrypted	N	
	Anonymized	N	
Participating Object (Patient)	ParticipantObjectTypeCode	Y	1
	ParticipantObjectTypeCodeRole	Y	1
	ParticipantObjectDataLifeCycle	N	
	ParticipantObjectIDTypeCode	Y	2
	ParticipantObjectSensitivity	N	
	ParticipantObjectID	Y	The Patient ID
	ParticipantObjectName	N	
	ParticipantObjectQuery	N	
	ParticipantObjectDetail	N	
	ParticipantObjectDescription	N	
Other messages			
AuditSourceIdentification	AuditEnterpriseSiteID	Y	Machine Name
	AuditSourceID	Y	<platform_id>, <product_serial_number>

Please note: This is the Audit Log Message for the DICOM Receive. The same message is generated in case of a DICOM Retrieve on the receiving side.

Table C.2.2-7 Audit Message Details –DICOM Study Deleted

Real-World Entities	Field Name	Supported	Value Constraints
Application Activity Message			
Event	EventID	Y	EV (110105, DCM, "DICOM Study Deleted")
	EventActionCode	Y	D – Delete
	EventDateTime	Y	Current date and Time
	EventOutcomeIndicator	Y	0 – Success 4 – Minor Failure 8 – Serious Failure 12 – Major Failure
	EventTypeCode	N	
Active Participant	UserID	Y	The User Name
	AlternativeUserID	N	
	UserName	N	
	UserIsRequestor	Y	False
	RoleIDCode	N	
	NetworkAccessPointTypeCode	N	
	NetworkAccessPointID	N	
Audit Log Used Message			
Participating Objects (Studies being transferred)	ParticipantObjectTypeCode	Y	2
	ParticipantObjectTypeCodeRole	Y	3
	ParticipantObjectDataLifeCycle	N	
	ParticipantObjectIDTypeCode	Y	EV (110180, DCM, “Study Instance UID”)
	ParticipantObjectSensitivity	N	
	ParticipantObjectID	Y	The Study Instance UID
	ParticipantObjectName	N	
	ParticipantObjectQuery	N	
	ParticipantObjectDetail	N	
	ParticipantObjectDescription	N	
	SOP Class UID	N	
	Accession Number	Y	“ ”
	NumberOfInstances	N	
	Encrypted	N	
	Anonymized	N	
Participating Object (Patient)	ParticipantObjectTypeCode	Y	1
	ParticipantObjectTypeCodeRole	Y	1
	ParticipantObjectDataLifeCycle	N	
	ParticipantObjectIDTypeCode	Y	2

Real-World Entities	Field Name	Supported	Value Constraints
	ParticipantObjectSensitivity	N	
	ParticipantObjectID	Y	The Patient ID
	ParticipantObjectName	N	
	ParticipantObjectQuery	N	
	ParticipantObjectDetail	N	
	ParticipantObjectDescription	N	
Other messages			
AuditSourceIdentification	AuditEnterpriseSiteID	Y	Machine Name
	AuditSourceID	Y	SyngoDataManagement

Table C.2.2-8 Audit Message Details –DICOM Study Deleted

Real-World Entities	Field Name	Supported	Value Constraints
Application Activity Message			
Event	EventID	Y	EV (110105, DCM, "DICOM Study Deleted")
	EventActionCode	Y	D
	EventDateTime	Y	Current date and Time
	EventOutcomeIndicator	Y	0 – Success 4 – Minor Failure 8 – Serious Failure 12 – Major Failure
	EventTypeCode	N	
Active Participant (The Person or Process deleting the Study)	UserID	Y	The User ID provided by the Operating System
	AlternativeUserID	N	
	UserName	N	
	UserIsRequestor	Y	false
	RoleIDCode	N	
	NetworkAccessPointTypeCode	N	
	NetworkAccessPointID	N	
Audit Log Used Message			
Participating Objects (Studies being transferred)	ParticipantObjectTypeCode	Y	2
	ParticipantObjectTypeCodeRole	Y	3
	ParticipantObjectDataLifeCycle	N	
	ParticipantObjectIDTypeCode	Y	EV (110180, DCM, “Study Instance UID”)
	ParticipantObjectSensitivity	N	
	ParticipantObjectID	Y	The Study Instance UID
	ParticipantObjectName	N	
	ParticipantObjectQuery	N	
	ParticipantObjectDetail	N	
	ParticipantObjectDescription	N	
	SOP Class UID	N	
	Accession Number	Y	“ ”
	NumberOfInstances	N	
	Encrypted	N	
	Anonymized	N	
Participating Object (Patient)	ParticipantObjectTypeCode	Y	1
	ParticipantObjectTypeCodeRole	Y	1
	ParticipantObjectDataLifeCycle	N	
	ParticipantObjectIDTypeCode	Y	2

Real-World Entities	Field Name	Supported	Value Constraints
	ParticipantObjectSensitivity	N	
	ParticipantObjectID	Y	The Patient ID
	ParticipantObjectName	N	
	ParticipantObjectQuery	N	
	ParticipantObjectDetail	N	
	ParticipantObjectDescription	N	
Participating Object (Patient Name)	ParticipantObjectTypeCode	Y	1
	ParticipantObjectTypeCodeRole	Y	1
	ParticipantObjectDataLifeCycle	N	
	ParticipantObjectIDTypeCode	Y	EV (110187, DCM, “Patient Name”)
	ParticipantObjectSensitivity	N	
	ParticipantObjectID	Y	The Patient Name
	ParticipantObjectName	N	
	ParticipantObjectQuery	N	
	ParticipantObjectDetail	N	
	ParticipantObjectDescription	N	
Participating Object (Patient’s Sex)	ParticipantObjectTypeCode	Y	1
	ParticipantObjectTypeCodeRole	Y	1
	ParticipantObjectDataLifeCycle	N	
	ParticipantObjectIDTypeCode	Y	EV (110188, DCM, “Patient Sex”)
	ParticipantObjectSensitivity	N	
	ParticipantObjectID	Y	The Patient’s Sex
	ParticipantObjectName	N	
	ParticipantObjectQuery	N	
	ParticipantObjectDetail	N	
	ParticipantObjectDescription	N	
Participating Object (Patient’s Date of Birth)	ParticipantObjectTypeCode	Y	1
	ParticipantObjectTypeCodeRole	Y	1
	ParticipantObjectDataLifeCycle	N	
	ParticipantObjectIDTypeCode	Y	EV (110189, DCM, “Patient Date of Birth”)
	ParticipantObjectSensitivity	N	
	ParticipantObjectID	Y	The Patient’s Date of Birth
	ParticipantObjectName	N	
	ParticipantObjectQuery	N	
	ParticipantObjectDetail	N	
	ParticipantObjectDescription	N	

Real-World Entities	Field Name	Supported	Value Constraints
Participating Object (User Text)	ParticipantObjectTypeCode	N	
	ParticipantObjectTypeCodeRole	N	
	ParticipantObjectDataLifeCycle	N	
	ParticipantObjectIDTypeCode	Y	1
	ParticipantObjectSensitivity	N	
	ParticipantObjectID	Y	The Patient's Date of Birth
	ParticipantObjectName	N	
	ParticipantObjectQuery	N	
	ParticipantObjectDetail	N	
	ParticipantObjectDescription	N	
	UserDefinedText	Y	An encoded Text describing, what happened (e.g. "Study deleted")
Other messages			
AuditSourceIdentification	AuditEnterpriseSiteID	Y	Machine Name
	AuditSourceID	Y	SyngoDataManagement

Table C.2.2-9 Audit Message Details – Patient Record

Real-World Entities	Field Name	Supported	Value Constraints
Application Activity Message			
Event	EventID	Y	EV (110110, DCM, "Patient Record")
	EventActionCode	Y	C – Create R – Read U – Update D – Delete
	EventDateTime	Y	Current date and Time
	EventOutcomeIndicator	Y	0 – Success 4 – Minor Failure 8 – Serious Failure 12 – Major Failure
	EventTypeCode	N	
User	UserID	Y	The User ID provided by the Operating System
	AlternativeUserID	N	
	UserName	N	
	UserIsRequestor	Y	false
	RoleIDCode	N	
	NetworkAccessPointTypeCode	N	
	NetworkAccessPointID	N	
Audit Log Used Message			
Participating Object (Patient)	ParticipantObjectTypeCode	Y	1
	ParticipantObjectTypeCodeRole	Y	1
	ParticipantObjectDataLifeCycle	N	
	ParticipantObjectIDTypeCode	Y	2
	ParticipantObjectSensitivity	N	
	ParticipantObjectID	Y	The Patient ID
	ParticipantObjectName	N	
	ParticipantObjectQuery	N	
	ParticipantObjectDetail	N	
	ParticipantObjectDescription	N	
Other messages			
AuditSourceIdentification	AuditEnterpriseSiteID	Y	Machine Name
	AuditSourceID	Y	The Module, which performed the action audited

Table C.2.2-10 Audit Message Details – Query

Real-World Entities	Field Name	Supported	Value Constraints
Application Activity Message			
Event	EventID	Y	EV (110112, DCM, "Query")
	EventActionCode	Y	E
	EventDateTime	Y	Current date and Time
	EventOutcomeIndicator	Y	0 – Success 4 – Minor Failure 8 – Serious Failure 12 – Major Failure
	EventTypeCode	N	
Active Participant (Process Issuing the Query)	UserID	Y	The Name of the Machine that sends the query
	AlternativeUserID	N	
	UserName	N	
	UserIsRequestor	Y	False
	RoleIDCode	Y	EV (110153, DCM, "Source Role ID")
	NetworkAccessPointTypeCode	Y	2
	NetworkAccessPointID	Y	The IP Address of the Machine, that sends the Query
Active Participant (The process, that will respond to the query)	UserID	Y	The Machine Name
	AlternativeUserID	N	
	UserName	N	
	UserIsRequestor	Y	False
	RoleIDCode	Y	EV (110152, DCM, "Destination Role ID")
	NetworkAccessPointTypeCode	Y	2
	NetworkAccessPointID	Y	The IP Address of the Remote Node, that sends the Query
Active Participant Other Participants that are known, especially third parties that requested the query	UserID	Y	The ID of the Process processing the Query
	AlternativeUserID	N	
	UserName	N	
	UserIsRequestor	Y	False
	RoleIDCode	N	
	NetworkAccessPointTypeCode	N	
	NetworkAccessPointID	N	
Audit Log Used Message			
Participating Objects (SOP Queried and the Query)	ParticipantObjectTypeCode	Y	2
	ParticipantObjectTypeCodeRole	Y	3
	ParticipantObjectDataLifeCycle	N	
	ParticipantObjectIDTypeCode	Y	DT (110181, DCM, "SOP Class UID")

Real-World Entities	Field Name	Supported	Value Constraints
	ParticipantObjectSensitivity	N	
	ParticipantObjectID	Y	If the ParticipantObjectIDTypeCode is (110181, DCM, "SOP Class UID"), then this field shall hold the UID of the SOP Class being queried
	ParticipantObjectName	N	
	ParticipantObjectQuery	Y	If the ParticipantObjectIDTypeCode is (110181, DCM, "SOP Class UID"), then this field shall hold the Dataset of the DICOM query, xs:base64Binary encoded. Otherwise, it shall be the query in the format of the protocol used.
	ParticipantObjectDetail	Y	A ParticipantObjectDetail element with the XML attribute "TransferSyntax" shall be present. The value of the Transfer Syntax attribute shall be the UID of the Transfer Syntax of the query. The element contents shall be xs:base64Binary encoding. The Transfer Syntax shall be a DICOM Transfer Syntax.
	ParticipantObjectDescription	N	
	SOP Class UID	N	
	Accession Number	N	
	NumberOfInstances	N	
	Encrypted	N	
	Anonymized	N	
Other messages			
AuditSourceIdentification	AuditEnterpriseSiteID	Y	Machine Name
	AuditSourceID	Y	<platform_id>, <product_serial_number>

Table C.2.2-11 Audit Message Details – Security Alert (Remote DICOM Node configuration changed)

Real-World Entities	Field Name	Supported	Value Constraints
Application Activity Message			
Event	EventID	Y	EV (110113, DCM, "Security Alert")
	EventActionCode	Y	E
	EventDateTime	Y	Current date and Time
	EventOutcomeIndicator	Y	0
	EventTypeCode	Y	EV (110131, DCM, "Software Configuration")
Active Participant (Reporting Person and/or Process)	UserID	Y	The User logged in on the Administration Portal or "Servicekey_login".
	AlternativeUserID	N	
	UserName	N	
	UserIsRequestor	N	true
	RoleIDCode	N	
	NetworkAccessPointTypeCode	N	
	NetworkAccessPointID	N	
Audit Log Used Message			
Participating Objects (Alert Subject)	ParticipantObjectTypeCode	Y	2
	ParticipantObjectTypeCodeRole	Y	13
	ParticipantObjectDataLifeCycle	N	
	ParticipantObjectIDTypeCode	Y	12
	ParticipantObjectSensitivity	N	
	ParticipantObjectID	Y	The name of the configuration file for the Remote Node
	ParticipantObjectName	N	
	ParticipantObjectQuery	N	
	ParticipantObjectDetail	Y	The base64 encoded description of the Remote DICOM Node Configuration
	ParticipantObjectDescription	N	
	SOP Class UID	N	
	Accession Number	N	
	NumberOfInstances	N	
	Encrypted	N	
	Anonymized	N	
Participating Objects (User Defined Text)	ParticipantObjectTypeCode	N	
	ParticipantObjectTypeCodeRole	N	
	ParticipantObjectDataLifeCycle	N	
	ParticipantObjectIDTypeCode	Y	1

Real-World Entities	Field Name	Supported	Value Constraints
	ParticipantObjectSensitivity	N	
	ParticipantObjectID	N	"User"
	ParticipantObjectName	N	
	ParticipantObjectQuery	N	
	ParticipantObjectDetail	Y	The base64 encoded description of the Remote DICOM Node Configuration
	ParticipantObjectDescription	N	
	SOP Class UID	N	
	Accession Number	N	
	NumberOfInstances	N	
	Encrypted	N	
	Anonymized	N	
Other messages			
AuditSourceIdentification	AuditEnterpriseSiteID	Y	Machine Name
	AuditSourceID	Y	"ServiceSoftware"

Table C.2.2-12 Audit Message Details – Security Alert (Remote DICOM Node encryption setting changed)

Real-World Entities	Field Name	Supported	Value Constraints
Application Activity Message			
Event	EventID	Y	EV (110113, DCM, "Security Alert")
	EventActionCode	Y	E
	EventDateTime	Y	Current date and Time
	EventOutcomeIndicator	Y	0
	EventTypeCode	Y	EV (110131, DCM, "Software Configuration")
Active Participant (Reporting Person and/or Process)	UserID	Y	The User logged in on the Administration Portal or "Servicekey_login".
	AlternativeUserID	N	
	UserName	N	
	UserIsRequestor	Y	true
	RoleIDCode	N	
	NetworkAccessPointTypeCode	N	
	NetworkAccessPointID	N	
Audit Log Used Message			
Participating Objects (Alert Subject)	ParticipantObjectTypeCode	Y	2
	ParticipantObjectTypeCodeRole	Y	13
	ParticipantObjectDataLifeCycle	N	
	ParticipantObjectIDTypeCode	Y	12
	ParticipantObjectSensitivity	N	
	ParticipantObjectID	Y	The name of the configuration file for the Remote Node
	ParticipantObjectName	N	
	ParticipantObjectQuery	N	
	ParticipantObjectDetail	Y	The base64 encoded description of the current Status of the encryption setting of the Remote Node
	ParticipantObjectDescription	N	
	SOP Class UID	N	
	Accession Number	N	
	NumberOfInstances	N	
	Encrypted	N	
	Anonymized	N	
Participating Objects (User Defined Text)	ParticipantObjectTypeCode	N	
	ParticipantObjectTypeCodeRole	N	
	ParticipantObjectDataLifeCycle	N	
	ParticipantObjectIDTypeCode	Y	1

Real-World Entities	Field Name	Supported	Value Constraints
	ParticipantObjectSensitivity	N	
	ParticipantObjectID	Y	“User”
	ParticipantObjectName	N	
	ParticipantObjectQuery	N	
	ParticipantObjectDetail	Y	The base64 encoded description of the current Status of the encryption setting of the Remote Node
	ParticipantObjectDescription	N	
	SOP Class UID	N	
	Accession Number	N	
	NumberOfInstances	N	
	Encrypted	N	
	Anonymized	N	
Other messages			
AuditSourceIdentification	AuditEnterpriseSiteID	Y	Machine Name
	AuditSourceID	Y	“ServiceSoftware”

Table C.2.2-13 Audit Message Details – Security Alert (Local DICOM Node encryption setting changed)

Real-World Entities	Field Name	Supported	Value Constraints
Application Activity Message			
Event	EventID	Y	EV (110113, DCM, "Security Alert")
	EventActionCode	Y	E
	EventDateTime	Y	Current date and Time
	EventOutcomeIndicator	Y	0
	EventTypeCode	Y	EV (110131, DCM, "Software Configuration")
Active Participant (Reporting Person and/or Process)	UserID	Y	The User logged in on the Administration Portal or "Servicekey_login".
	AlternativeUserID	N	
	UserName	N	
	UserIsRequestor	Y	true
	RoleIDCode	N	
	NetworkAccessPointTypeCode	N	
	NetworkAccessPointID	N	
Audit Log Used Message			
Participating Objects (Alert Subject)	ParticipantObjectTypeCode	Y	2
	ParticipantObjectTypeCodeRole	Y	13
	ParticipantObjectDataLifeCycle	N	
	ParticipantObjectIDTypeCode	Y	12
	ParticipantObjectSensitivity	N	
	ParticipantObjectID	Y	The name of the configuration file for the Local Node
	ParticipantObjectName	N	
	ParticipantObjectQuery	N	
	ParticipantObjectDetail	Y	The base64 encoded description of the current Status of the encryption setting of the Local Node
	ParticipantObjectDescription	N	
	SOP Class UID	N	
	Accession Number	N	
	NumberOfInstances	N	
	Encrypted	N	
	Anonymized	N	
Participating Objects (User Defined Text)	ParticipantObjectTypeCode	N	
	ParticipantObjectTypeCodeRole	N	
	ParticipantObjectDataLifeCycle	N	
	ParticipantObjectIDTypeCode	Y	1

Real-World Entities	Field Name	Supported	Value Constraints
	ParticipantObjectSensitivity	N	
	ParticipantObjectID	Y	“User”
	ParticipantObjectName	N	
	ParticipantObjectQuery	N	
	ParticipantObjectDetail	Y	The base64 encoded description of the current Status of the encryption setting of the Local Node
	ParticipantObjectDescription	N	
	SOP Class UID	N	
	Accession Number	N	
	NumberOfInstances	N	
	Encrypted	N	
	Anonymized	N	
Other messages			
AuditSourceIdentification	AuditEnterpriseSiteID	Y	Machine Name
	AuditSourceID	Y	“ServiceSoftware”

Table C.2.2-14 Audit Message Details – Security Alert (Remote DICOM Node encapsulation setting changed)

Real-World Entities	Field Name	Supported	Value Constraints
Application Activity Message			
Event	EventID	Y	EV (110113, DCM, "Security Alert")
	EventActionCode	Y	E
	EventDateTime	Y	Current date and Time
	EventOutcomeIndicator	Y	0
	EventTypeCode	Y	EV (110131, DCM, "Software Configuration")
Active Participant (Reporting Person and/or Process)	UserID	Y	The User logged in on the Administration Portal or "Servicekey_login".
	AlternativeUserID	N	
	UserName	N	
	UserIsRequestor	N	true
	RoleIDCode	N	
	NetworkAccessPointTypeCode	N	
	NetworkAccessPointID	N	
Audit Log Used Message			
Participating Objects (Alert Subject)	ParticipantObjectTypeCode	Y	2
	ParticipantObjectTypeCodeRole	Y	13
	ParticipantObjectDataLifeCycle	N	
	ParticipantObjectIDTypeCode	Y	12
	ParticipantObjectSensitivity	N	
	ParticipantObjectID	Y	The name of the configuration file for the Remote Node
	ParticipantObjectName	N	
	ParticipantObjectQuery	N	
	ParticipantObjectDetail	Y	The base64 encoded description of the current Status of the encapsulation setting of the Local Node
	ParticipantObjectDescription	N	
	SOP Class UID	N	
	Accession Number	N	
	NumberOfInstances	N	
	Encrypted	N	
	Anonymized	N	
Participating Objects (User Defined Text)	ParticipantObjectTypeCode	N	
	ParticipantObjectTypeCodeRole	N	
	ParticipantObjectDataLifeCycle	N	
	ParticipantObjectIDTypeCode	Y	1

Real-World Entities	Field Name	Supported	Value Constraints
	ParticipantObjectSensitivity	N	
	ParticipantObjectID	Y	“User”
	ParticipantObjectName	N	
	ParticipantObjectQuery	N	
	ParticipantObjectDetail	Y	The base64 encoded description of the current Status of the encapsulation setting of the Local Node
	ParticipantObjectDescription	N	
	SOP Class UID	N	
	Accession Number	N	
	NumberOfInstances	N	
	Encrypted	N	
	Anonymized	N	
Other messages			
AuditSourceIdentification	AuditEnterpriseSiteID	Y	Machine Name
	AuditSourceID	Y	“ServiceSoftware”

Table C.2.2-15 Audit Message Details – Security Alert (Remote DICOM Node authentication failed)

Real-World Entities	Field Name	Supported	Value Constraints
Application Activity Message			
Event	EventID	Y	EV (110113, DCM, "Security Alert")
	EventActionCode	Y	E
	EventDateTime	Y	Current date and Time
	EventOutcomeIndicator	Y	4
	EventTypeCode	Y	EV (110126, DCM, "Node Athentication")
Active Participant (Reporting Person and/or Process)	UserID	Y	The IP Address of the initiator if a remote system initiated the communication. The User ID as <login_name>@<domain_name> if the local system initiated the communication
	AlternativeUserID	N	
	UserName	N	
	UserIsRequestor	Y	true
	RoleIDCode	N	
	NetworkAccessPointTypeCode	N	
	NetworkAccessPointID	N	
Active Participant (Performing Person or Process)	UserID	Y	"Remote Peer" if a remote system initiated the communication. The User ID as <login_name>@<domain_name> if the local system initiated the communication
	AlternativeUserID	N	
	UserName	N	
	UserIsRequestor	Y	false
	RoleIDCode	Y	EV (110150, DCM, "Application")
	NetworkAccessPointTypeCode	Y	2
	NetworkAccessPointID	Y	The IP Address
Audit Log Used Message			
Participating Objects (Alert Subject)	ParticipantObjectTypeCode	Y	2
	ParticipantObjectTypeCodeRole	Y	13
	ParticipantObjectDataLifeCycle	N	
	ParticipantObjectIDTypeCode	Y	12
	ParticipantObjectSensitivity	N	
	ParticipantObjectID	Y	The name of the configuration file for the Remote Node
	ParticipantObjectName	N	
	ParticipantObjectQuery	N	

Real-World Entities	Field Name	Supported	Value Constraints
	ParticipantObjectDetail	Y	The base64 encoded description of the current Status of the encapsulation setting of the Local Node
	ParticipantObjectDescription	N	
	SOP Class UID	N	
	Accession Number	N	
	NumberOfInstances	N	
	Encrypted	N	
	Anonymized	N	
Participating Objects (User Defined Text)	ParticipantObjectTypeCode	Y	2
	ParticipantObjectTypeCodeRole	Y	13
	ParticipantObjectDataLifeCycle	N	
	ParticipantObjectIDTypeCode	Y	1
	ParticipantObjectSensitivity	N	
	ParticipantObjectID	Y	12
	ParticipantObjectName	N	
	ParticipantObjectQuery	N	
	ParticipantObjectDetail	Y	The base64 encoded description of the current Status of the encapsulation setting of the Local Node
	ParticipantObjectDescription	N	
	SOP Class UID	N	
	Accession Number	N	
	NumberOfInstances	N	
	Encrypted	N	
	Anonymized	N	
Other messages			
AuditSourceIdentification	AuditEnterpriseSiteID	Y	Machine Name
	AuditSourceID	Y	“DCM”

Table C.2.2-16 Audit Message Details – Security Alert (Passphrase for auto connect secure communication set)

Real-World Entities	Field Name	Supported	Value Constraints
Application Activity Message			
Event	EventID	Y	EV (110113, DCM, "Security Alert")
	EventActionCode	Y	E
	EventDateTime	Y	Current date and Time
	EventOutcomeIndicator	Y	0
	EventTypeCode	Y	EV (110131, DCM, "Software Configuration")
Active Participant (Reporting Person and/or Process)	UserID	Y	The User ID as <login_name>@<domain_name> if the local system initiated the communication or "Servicekey_login" if a Service Key was used by the user authentication.
	AlternativeUserID	N	
	UserName	N	
	UserIsRequestor	Y	true
	RoleIDCode	N	
	NetworkAccessPointTypeCode	N	
	NetworkAccessPointID	N	
Audit Log Used Message			
Participating Objects (Alert Subject)	ParticipantObjectTypeCode	Y	2
	ParticipantObjectTypeCodeRole	Y	13
	ParticipantObjectDataLifeCycle	N	
	ParticipantObjectIDTypeCode	Y	12
	ParticipantObjectSensitivity	N	
	ParticipantObjectID	Y	The name of the configuration file for the Transfer Preferences
	ParticipantObjectName	N	
	ParticipantObjectQuery	N	
	ParticipantObjectDetail	Y	"Passphrase saved for SmartConnect secure communication.", base64 encoded
	ParticipantObjectDescription	N	
	SOP Class UID	N	
	Accession Number	N	
	NumberOfInstances	N	
	Encrypted	N	
	Anonymized	N	
Participating Objects (User Defined Text)	ParticipantObjectTypeCode	N	
	ParticipantObjectTypeCodeRole	N	

Real-World Entities	Field Name	Supported	Value Constraints
	ParticipantObjectDataLifeCycle	N	
	ParticipantObjectIDTypeCode	Y	1
	ParticipantObjectSensitivity	N	
	ParticipantObjectID	N	
	ParticipantObjectName	N	
	ParticipantObjectQuery	N	
	ParticipantObjectDetail	Y	"Passphrase saved for SmartConnect secure communication.", base64 encoded
	ParticipantObjectDescription	N	
	SOP Class UID	N	
	Accession Number	N	
	NumberOfInstances	N	
	Encrypted	N	
	Anonymized	N	
Other messages			
AuditSourceIdentification	AuditEnterpriseSiteID	Y	Machine Name
	AuditSourceID	Y	"Service Software"

Table C.2.2-17 Audit Message Details – Security Alert (Auto connect secure communication service state changed)

Real-World Entities	Field Name	Supported	Value Constraints
Application Activity Message			
Event	EventID	Y	EV (110113, DCM, "Security Alert")
	EventActionCode	Y	E
	EventDateTime	Y	Current date and Time
	EventOutcomeIndicator	Y	0
	EventTypeCode	Y	EV (110131, DCM, "Software Configuration")
Active Participant (Reporting Person and/or Process)	UserID	Y	The User ID as <login_name>@<domain_name> if the local system initiated the communication or "Servicekey_login" if a Service Key was used by the user authentication.
	AlternativeUserID	N	
	UserName	N	
	UserIsRequestor	Y	true
	RoleIDCode	N	
	NetworkAccessPointTypeCode	N	
	NetworkAccessPointID	N	
Audit Log Used Message			
Participating Objects (Alert Subject)	ParticipantObjectTypeCode	Y	2
	ParticipantObjectTypeCodeRole	Y	13
	ParticipantObjectDataLifeCycle	N	
	ParticipantObjectIDTypeCode	Y	12
	ParticipantObjectSensitivity	N	
	ParticipantObjectID	Y	The name of the configuration file for the Transfer Preferences
	ParticipantObjectName	N	
	ParticipantObjectQuery	N	
	ParticipantObjectDetail	Y	The current state of the connect secure communication service, base64 encoded
	ParticipantObjectDescription	N	
	SOP Class UID	N	
	Accession Number	N	
	NumberOfInstances	N	
	Encrypted	N	
	Anonymized	N	
Participating Objects (User Defined Text)	ParticipantObjectTypeCode	N	
	ParticipantObjectTypeCodeRole	N	

Real-World Entities	Field Name	Supported	Value Constraints
	ParticipantObjectDataLifeCycle	N	
	ParticipantObjectIDTypeCode	Y	1
	ParticipantObjectSensitivity	N	
	ParticipantObjectID	N	
	ParticipantObjectName	N	
	ParticipantObjectQuery	N	
	ParticipantObjectDetail	Y	The current state of the auto connect secure communication service, base64 encoded
	ParticipantObjectDescription	N	
	SOP Class UID	N	
	Accession Number	N	
	NumberOfInstances	N	
	Encrypted	N	
	Anonymized	N	
Other messages			
AuditSourceIdentification	AuditEnterpriseSiteID	Y	Machine Name
	AuditSourceID	Y	“Service Software”

Table C.2.2-18 Audit Message Details – Security Alert (Auto connect secure communication connection option changed)

Real-World Entities	Field Name	Supported	Value Constraints
Application Activity Message			
Event	EventID	Y	EV (110113, DCM, "Security Alert")
	EventActionCode	Y	E
	EventDateTime	Y	Current date and Time
	EventOutcomeIndicator	Y	0
	EventTypeCode	Y	EV (110131, DCM, "Software Configuration")
Active Participant (Reporting Person and/or Process)	UserID	Y	The User ID as <login_name>@<domain_name> if the local system initiated the communication or "Servicekey_login" if a Service Key was used by the user authentication.
	AlternativeUserID	N	
	UserName	N	
	UserIsRequestor	Y	true
	RoleIDCode	N	
	NetworkAccessPointTypeCode	N	
	NetworkAccessPointID	N	
Audit Log Used Message			
Participating Objects (Alert Subject)	ParticipantObjectTypeCode	Y	2
	ParticipantObjectTypeCodeRole	Y	13
	ParticipantObjectDataLifeCycle	N	
	ParticipantObjectIDTypeCode	Y	12
	ParticipantObjectSensitivity	N	
	ParticipantObjectID	Y	The name of the configuration file for the Transfer Preferences
	ParticipantObjectName	N	
	ParticipantObjectQuery	N	
	ParticipantObjectDetail	Y	The current state of the auto connect secure communication connection option, base64 encoded
	ParticipantObjectDescription	N	
	SOP Class UID	N	
	Accession Number	N	
	NumberOfInstances	N	
	Encrypted	N	
	Anonymized	N	
	ParticipantObjectTypeCode	N	

Real-World Entities	Field Name	Supported	Value Constraints
Participating Objects (User Defined Text)	ParticipantObjectTypeCodeRole	N	
	ParticipantObjectDataLifeCycle	N	
	ParticipantObjectIDTypeCode	Y	1
	ParticipantObjectSensitivity	N	
	ParticipantObjectID	N	
	ParticipantObjectName	N	
	ParticipantObjectQuery	N	
	ParticipantObjectDetail	Y	The current state of the auto connect secure communication connection option, base64 encoded
	ParticipantObjectDescription	N	
	SOP Class UID	N	
	Accession Number	N	
	NumberOfInstances	N	
	Encrypted	N	
	Anonymized	N	
Other messages			
AuditSourceIdentification	AuditEnterpriseSiteID	Y	Machine Name
	AuditSourceID	Y	“Service Software”

Table C.2.2-19 Audit Message Details – Security Alert (Storage Commitment Service is enabled or disabled for a Remote Node)

Real-World Entities	Field Name	Supported	Value Constraints
Application Activity Message			
Event	EventID	Y	EV (110113, DCM, "Security Alert")
	EventActionCode	Y	E
	EventDateTime	Y	Current date and Time
	EventOutcomeIndicator	Y	0
	EventTypeCode	Y	EV (110131, DCM, "Software Configuration")
Active Participant (Reporting Person and/or Process)	UserID	Y	The User ID as <login_name>@<domain_name> if the local system initiated the communication or "Servicekey_login" if a Service Key was used by the user authentication.
	AlternativeUserID	N	
	UserName	N	
	UserIsRequestor	Y	true
	RoleIDCode	N	
	NetworkAccessPointTypeCode	N	
	NetworkAccessPointID	N	
Audit Log Used Message			
Participating Objects (Alert Subject)	ParticipantObjectTypeCode	Y	2
	ParticipantObjectTypeCodeRole	Y	13
	ParticipantObjectDataLifeCycle	N	
	ParticipantObjectIDTypeCode	Y	12
	ParticipantObjectSensitivity	N	
	ParticipantObjectID	Y	"Archiving and Deletion Configuration"
	ParticipantObjectName	N	
	ParticipantObjectQuery	N	
	ParticipantObjectDetail	Y	The current status of the Storage Commitment Service for the Remote Node, base64 encoded
	ParticipantObjectDescription	N	
	SOP Class UID	N	
	Accession Number	N	
	NumberOfInstances	N	
	Encrypted	N	
	Anonymized	N	
Other messages			
AuditSourceIdentification	AuditEnterpriseSiteID	Y	Machine Name

Real-World Entities	Field Name	Supported	Value Constraints
	AuditSourceID	Y	“Service Software”

Table C.2.2-20 Audit Message Details – Security Alert (Certificate was unpinned from a Remote Node)

Real-World Entities	Field Name	Supported	Value Constraints
Application Activity Message			
Event	EventID	Y	EV (110113, DCM, "Security Alert")
	EventActionCode	Y	E
	EventDateTime	Y	Current date and Time
	EventOutcomeIndicator	Y	0
	EventTypeCode	Y	EV (110131, DCM, "Software Configuration")
Active Participant (Reporting Person and/or Process)	UserID	Y	The User ID as <login_name>@<domain_name> if the local system initiated the communication or "Servicekey_login" if a Service Key was used by the user authentication.
	AlternativeUserID	N	
	UserName	N	
	UserIsRequestor	Y	true
	RoleIDCode	N	
	NetworkAccessPointTypeCode	N	
	NetworkAccessPointID	N	
Audit Log Used Message			
Participating Objects (Alert Subject)	ParticipantObjectTypeCode	Y	2
	ParticipantObjectTypeCodeRole	Y	13
	ParticipantObjectDataLifeCycle	N	
	ParticipantObjectIDTypeCode	Y	12
	ParticipantObjectSensitivity	N	
	ParticipantObjectID	Y	"Archiving and Deletion Configuration"
	ParticipantObjectName	N	
	ParticipantObjectQuery	N	
	ParticipantObjectDetail	Y	The user has decided to delete the existing pinning for the Remote Node Name: <remote_node_name>, IP Address: <remote_node_ip_address>. The following pinned certificate ID has been unpinned: <unpinned_certificate_id>.
	ParticipantObjectDescription	N	
	SOP Class UID	N	
	Accession Number	N	
	NumberOfInstances	N	
	Encrypted	N	
	Anonymized	N	

Real-World Entities	Field Name	Supported	Value Constraints
Other messages			
AuditSourceIdentification	AuditEnterpriseSiteID	Y	Machine Name
	AuditSourceID	Y	<platform_id>. <product_serial_number>

Table C.2.2-21 Audit Message Details – Security Alert (Certificate was pinned to a Remote Node)

Real-World Entities	Field Name	Supported	Value Constraints
Application Activity Message			
Event	EventID	Y	EV (110113, DCM, "Security Alert")
	EventActionCode	Y	E
	EventDateTime	Y	Current date and Time
	EventOutcomeIndicator	Y	0
	EventTypeCode	Y	EV (110131, DCM, "Software Configuration")
Active Participant (Reporting Person and/or Process)	UserID	Y	The User ID as <login_name>@<domain_name> if the local system initiated the communication or "Servicekey_login" if a Service Key was used by the user authentication.
	AlternativeUserID	N	
	UserName	N	
	UserIsRequestor	Y	true
	RoleIDCode	N	
	NetworkAccessPointTypeCode	N	
	NetworkAccessPointID	N	
Audit Log Used Message			
Participating Objects (Alert Subject)	ParticipantObjectTypeCode	Y	2
	ParticipantObjectTypeCodeRole	Y	13
	ParticipantObjectDataLifeCycle	N	
	ParticipantObjectIDTypeCode	Y	12
	ParticipantObjectSensitivity	N	
	ParticipantObjectID	Y	"Archiving and Deletion Configuration"
	ParticipantObjectName	N	
	ParticipantObjectQuery	N	
	ParticipantObjectDetail	Y	The user has decided to trust and pin a certificate for the Remote Node Name: <remote_node_name>, IP Address: <remote_node_ip_address>. Certificate details: Issuer: <certificate_issuer>, Subject: <certificate_subject>, Not Before <certificate_not_before>, Not After: <certificate_not_after>, Thumbprint: <certificate_thumbprint>, Version: <certificate_version>. The following certificate ID has been pinned: <pinned_certificate_id>.
	ParticipantObjectDescription	N	
	SOP Class UID	N	
	Accession Number	N	

Real-World Entities	Field Name	Supported	Value Constraints
	NumberOfInstances	N	
	Encrypted	N	
	Anonymized	N	
Other messages			
AuditSourceIdentification	AuditEnterpriseSiteID	Y	Machine Name
	AuditSourceID	Y	<platform_id>. <product_serial_number>

Table C.2.2-22 Audit Message Details – Security Alert (Archive marking of a Remote Node has changed)

Real-World Entities	Field Name	Supported	Value Constraints
Application Activity Message			
Event	EventID	Y	EV (110113, DCM, "Security Alert")
	EventActionCode	Y	E
	EventDateTime	Y	Current date and Time
	EventOutcomeIndicator	Y	0
	EventTypeCode	Y	EV (110131, DCM, "Software Configuration")
Active Participant (Reporting Person and/or Process)	UserID	Y	The User ID as <login_name>@<domain_name> if the local system initiated the communication or "Servicekey_login" if a Service Key was used by the user authentication.
	AlternativeUserID	N	
	UserName	N	
	UserIsRequestor	Y	true
	RoleIDCode	N	
	NetworkAccessPointTypeCode	N	
	NetworkAccessPointID	N	
Audit Log Used Message			
Participating Objects (Alert Subject)	ParticipantObjectTypeCode	Y	2
	ParticipantObjectTypeCodeRole	Y	13
	ParticipantObjectDataLifeCycle	N	
	ParticipantObjectIDTypeCode	Y	12
	ParticipantObjectSensitivity	N	
	ParticipantObjectID	Y	The configuration file for the Remote Node modified
	ParticipantObjectName	N	
	ParticipantObjectQuery	N	
	ParticipantObjectDetail	Y	The status of the archive markings, base64 encoded
	ParticipantObjectDescription	N	
	SOP Class UID	N	
	Accession Number	N	
	NumberOfInstances	N	
	Encrypted	N	
	Anonymized	N	
Participating Objects (User Defined Text)	ParticipantObjectTypeCode	N	
	ParticipantObjectTypeCodeRole	N	

Real-World Entities	Field Name	Supported	Value Constraints
	ParticipantObjectDataLifeCycle	N	
	ParticipantObjectIDTypeCode	Y	1
	ParticipantObjectSensitivity	N	
	ParticipantObjectID	N	
	ParticipantObjectName	N	
	ParticipantObjectQuery	N	
	ParticipantObjectDetail	Y	The status of the archive markings, base64 encoded
	ParticipantObjectDescription	N	
	SOP Class UID	N	
	Accession Number	N	
	NumberOfInstances	N	
	Encrypted	N	
	Anonymized	N	
Other messages			
AuditSourceIdentification	AuditEnterpriseSiteID	Y	Machine Name
	AuditSourceID	Y	“Service Software”

Table C.2.2-23 Audit Message Details – User Authentication

Real-World Entities	Field Name	Supported	Value Constraints
Application Activity Message			
Event	EventID	Y	EV (110114, DCM, "User Authentication")
	EventActionCode	Y	E
	EventDateTime	Y	Current date and Time
	EventOutcomeIndicator	Y	0 or 4
	EventTypeCode	Y	EV (110122, DCM, “Login”)
Active Participant (Person authenticated or claimed)	UserID	Y	The ID of the User requesting authentication
	AlternativeUserID	N	
	UserName	N	
	UserIsRequestor	Y	true
	RoleIDCode	N	
	NetworkAccessPointTypeCode	Y	1
	NetworkAccessPointID	Y	“”
Other messages			
AuditSourceIdentification	AuditEnterpriseSiteID	Y	Machine Name
	AuditSourceID	Y	“Service Software”

Table C.2.2-24 Audit Message Details – Patient Record

Real-World Entities	Field Name	Supported	Value Constraints
Application Activity Message			
Event	EventID	Y	EV (110110, DCM, "Patient Record")
	EventActionCode	Y	C – create R – read U – update D – delete
	EventDateTime	Y	Current date and Time
	EventOutcomeIndicator	N	
	EventTypeCode	N	
User	UserID	Y	The ID of the User requesting authentication
	AlternativeUserID	N	
	UserName	N	
	UserIsRequestor	Y	true
	RoleIDCode	N	
	NetworkAccessPointTypeCode	N	
	NetworkAccessPointID	N	
Audit Log Used Message			
Patient	ParticipantObjectTypeCode	Y	1
	ParticipantObjectTypeCodeRole	Y	1
	ParticipantObjectDataLifeCycle	N	
	ParticipantObjectIDTypeCode	Y	2
	ParticipantObjectSensitivity	N	
	ParticipantObjectID	N	The Patient ID
	ParticipantObjectName	N	
	ParticipantObjectQuery	N	
	ParticipantObjectDetail	N	
	ParticipantObjectDescription	N	
	SOP Class UID	N	
	Accession Number	N	
	NumberOfInstances	N	
Other messages			
Audit Source Identification	AuditEnterpriseSiteID	Y	The Machine Name
	AuditSourceID	Y	"Workflow"

Table C.2.2-25 Audit Message Details – Patient Record

Real-World Entities	Field Name	Supported	Value Constraints
Application Activity Message			
Event	EventID	Y	EV (110111, DCM, " Procedure Record")
	EventActionCode	Y	C – create R – read U – update D – delete
	EventDateTime	Y	Current date and Time
	EventOutcomeIndicator	Y	0
	EventTypeCode	Y	EV (110131, DCM, “Software Configuration”)
User	UserID	Y	The ID of the User
	AlternativeUserID	N	
	UserName	N	
	UserIsRequestor	Y	true
	RoleIDCode	N	
	NetworkAccessPointTypeCode	N	
	NetworkAccessPointID	N	
Audit Log Used Message			
Study	ParticipantObjectTypeCode	Y	2
	ParticipantObjectTypeCodeRole	Y	3
	ParticipantObjectDataLifeCycle	N	
	ParticipantObjectIDTypeCode	Y	EV (110180, DCM, “Study Instance UID”)
	ParticipantObjectSensitivity	N	
	ParticipantObjectID	Y	The ID of the acting Workflow
	ParticipantObjectName	N	
	ParticipantObjectQuery	N	
	ParticipantObjectDetail	N	
	ParticipantObjectDescription	Y	“”
	SOP Class UID	N	
	Accession Number	N	
	NumberOfInstances	N	
	Encrypted	N	
	Anonymized	N	
Patient	ParticipantObjectTypeCode	Y	1
	ParticipantObjectTypeCodeRole	Y	1
	ParticipantObjectDataLifeCycle	N	
	ParticipantObjectIDTypeCode	Y	2

Real-World Entities	Field Name	Supported	Value Constraints
	ParticipantObjectSensitivity	N	
	ParticipantObjectID	Y	The Patient ID
	ParticipantObjectName	N	
	ParticipantObjectQuery	N	
	ParticipantObjectDetail	N	
	ParticipantObjectDescription	N	
	SOP Class UID	N	
	Accession Number	N	
	NumberOfInstances	N	
	Encrypted	N	
	Anonymized	N	
Other messages			
AuditSourceIdentification	AuditEnterpriseSiteID	Y	Machine Name
	AuditSourceID	Y	“Workflow”

C.2.3 Audit Trail Message Transmission Profile – SYSLOG – TLS

Currently only RFC 3164 is supported for Audit Trail Message Transmission.

To avoid sniffing attacks and disclosure of audit trail logs, please set the Secure TCP protocol. Encrypted transmission is possible only if the Secure TCP protocol is selected and a certificate is referenced by its thumbprint.

C.2.4 Audit Trail Message Transmission Profile – SYSLOG – UDP

Currently only RFC 3164 is supported for Audit Trail Message Transmission.

To avoid sniffing attacks and disclosure of audit trail logs, please set the Secure TCP protocol. Encrypted transmission is possible only if the Secure TCP protocol is selected and a certificate is referenced by its thumbprint.

C.2.5 Secure Transport Connection Details

Table C.2.5-1 lists the secure transport connection profiles and cipher suites supported:

Table C.2.5-1 Secure Transport Connection Profiles and cipher suites

Profile	cipher suite	Default Preference Order (from 1=preferred to n=less preferred)
TLS 1.2	TLS_ECDHE_ECDSA_WITH_AES_256_GCM_SHA384	1
	TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256	1
	TLS_ECDHE_RSA_WITH_AES_256_GCM_SHA384	1
	TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256	1
	TLS_DHE_RSA_WITH_AES_256_GCM_SHA384	2
	TLS_DHE_RSA_WITH_AES_128_GCM_SHA256	2
	TLS_ECDHE_ECDSA_WITH_AES_256_CBC_SHA384	3
	TLS_ECDHE_ECDSA_WITH_AES_128_CBC_SHA256	3
	TLS_ECDHE_ECDSA_WITH_AES_256_CBC_SHA	3
	TLS_ECDHE_ECDSA_WITH_AES_128_CBC_SHA	3
	TLS_ECDHE_RSA_WITH_AES_256_CBC_SHA	3
	TLS_ECDHE_RSA_WITH_AES_128_CBC_SHA	3
	TLS_ECDHE_RSA_WITH_AES_256_CBC_SHA384	3
	TLS_ECDHE_RSA_WITH_AES_128_CBC_SHA256	3
	TLS_RSA_WITH_AES_256_GCM_SHA384	3
	TLS_RSA_WITH_AES_128_GCM_SHA256	3
	TLS_RSA_WITH_AES_256_CBC_SHA256	3
	TLS_RSA_WITH_AES_128_CBC_SHA256	3
	TLS_RSA_WITH_AES_256_CBC_SHA	3
	TLS_RSA_WITH_AES_128_CBC_SHA	3

Table C.2.5-2 describes the configurable parameters and behaviors supported by this product for the Secure Transport Connection:

Table C.2.5-2 Secure Transport Connection Configuration

Local Secure Transport Connection Configuration			
Parameter/Behavior	**Configurable**	**Default Value**	**Comments**
Common Secure Transport Connection parameters			
Port	See Section 6 Configuration		
A-P-ABORT provider reason in case of integrity check failure			
BCP 195 RFC 8996, 9325 TLS Secure Transport Connection Profile			
Remote Secure Transport Connection Configuration Parameters			
Parameter	**Configurable**	**Default Value**	**Comments**
Common Secure Transport Connection Parameters			
Port	See Section 6 Configuration		
A-P-ABORT provider reason in case of integrity check failure			
BCP 195 RFC 8996, 9325 TLS Secure Transport Connection Profile			

C.2.6 Attribute Confidentiality Details

De-Identification is not supported in syngo CT. As an alternative the Data Minimization Feature is provided.

C.2.7 Digital Signature Details

N/A

C.2.8 Additional DICOM Security Profile Details

N/A

Annex D Mapping of Attributes

D.1 Mapping between Modality Worklist, Instances and MPPS

The following IHE scenarios are covered by below table:

- SCHEDULED: patient data created based on requested procedure(s) via MWL
- UNSCHEDULED: patient data created based on local/manual patient registration.
- APPEND: previous patient examination is extended by additional requested procedure(s) via MWL

In the “Value Source” columns, the following values are used. The column cell may additionally contain an Attribute Tag if the value is copied from a different Attribute.

- GENERATED: The value is generated by the system.
- SRC_INSTANCE: The value is copied from previously created Instances.
- MWL: The value is copied from Modality Worklist entry.
- USER: The value is entered by the user.
- SCANNED: The value is read from a barcode scanner or similar device.
- EMPTY: The Attribute is sent without value.

The “Destination” columns either contain TOP, if the Attribute is added to the top level Data Set of the Instance, or contain the Attribute Tag of the Sequence the Attribute will be added to. The “Comments” column can be used to provide additional information regarding the values added to the Instance or MPPS.

Table D-1 Mapping of Attributes from Modality Worklist to Instance and MPPS

Attribute Name in Image/MPPS	Tag	Scenario	Image		MPPS		Comments
			Value Source	Destination	Value Source	Destination	
Specific Character Set	(0008,0005)	SCHEDULED	MWL ; GENERATED	TOP	MWL	TOP	
		UNSCHEDULED	GENERATED	TOP	GENERATED	TOP	
		APPEND	SRC_INSTANCE	TOP	SRC_INSTANCE	TOP	
Accession Number	(0008,0050)	SCHEDULED	MWL	TOP	MWL	(0040,0270)	
		UNSCHEDULED	USER	TOP	EMPTY	(0040,0270)	
		APPEND	SRC_INSTANCE	TOP	SRC_INSTANCE	(0040,0270)	
Institution Name	(0008,0080)	SCHEDULED	MWL ; USER	TOP	N/A	N/A	
		UNSCHEDULED	CONFIGURATION	TOP	N/A	N/A	
		APPEND	SRC_INSTANCE	TOP	N/A	N/A	
Institution Address	(0008,0081)	SCHEDULED	MWL ; USER	TOP	N/A	N/A	
		UNSCHEDULED	CONFIGURATION	TOP	N/A	N/A	
		APPEND	SRC_INSTANCE	TOP	N/A	N/A	
Referring Physician's Name	(0008,0090)	SCHEDULED	MWL	TOP	N/A	N/A	
		UNSCHEDULED	USER	TOP	N/A	N/A	
		APPEND	SRC_INSTANCE	TOP	N/A	N/A	
Admitting Diagnoses Description	(0008,1080)	SCHEDULED	MWL ; USER	TOP	N/A	N/A	
		UNSCHEDULED	USER	TOP	N/A	N/A	
		APPEND	SRC_INSTANCE	TOP	N/A	N/A	
Procedure Code Sequence	(0008,1032)	SCHEDULED	MWL	TOP	MWL	TOP	Value is always taken from (0032,1064) Requested Procedure Code Sequence
		UNSCHEDULED	N/A	N/A	N/A	N/A	
		APPEND	SRC_INSTANCE	TOP	SRC_INSTANCE	TOP	

Attribute Name in Image/MPPS	Tag	Scenario	Image		MPPS		Comments
			Value Source	Destination	Value Source	Destination	
Study Description	(0008,1030)	SCHEDULED	GENERATED	TOP	N/A	N/A	Default is the name of the selected protocol. Possibility to use Requested Procedure Description, if configured.
		UNSCHEDULED	GENERATED	TOP	N/A	N/A	
		APPEND	SRC_INSTANCE	TOP	N/A	N/A	
Performing Physician's Name	(0008,1050)	SCHEDULED	MWL; USER	TOP	SRC_INSTANCE	(0040,0340)	In case of MWL, value is taken from (0040,0006) Scheduled Performing Physician's Name
		UNSCHEDULED	USER	TOP	SRC_INSTANCE	(0040,0340)	
		APPEND	SRC_INSTANCE	TOP	SRC_INSTANCE	(0040,0340)	
Operators' Name	(0008,1070)	SCHEDULED	USER	TOP	SRC_INSTANCE	(0040,0340)	
		UNSCHEDULED	USER	TOP	SRC_INSTANCE	(0040,0340)	
		APPEND	SRC_INSTANCE	TOP	SRC_INSTANCE	(0040,0340)	
Series Description	(0008,103E)	SCHEDULED	GENERATED	TOP	SRC_INSTANCE	(0040,0340)	
		UNSCHEDULED	GENERATED	TOP	SRC_INSTANCE	(0040,0340)	
		APPEND	GENERATED	TOP	SRC_INSTANCE	(0040,0340)	
Referenced Study Sequence	(0008,1110)	SCHEDULED	MWL	TOP	MWL	(0040,0270)	
		UNSCHEDULED	USER	TOP	USER	(0040,0270)	
		APPEND	SRC_INSTANCE	TOP	SRC_INSTANCE	(0040,0270)	
Patient's Name	(0010,0010)	SCHEDULED	MWL	TOP	MWL	TOP	
		UNSCHEDULED	USER / GENERATED	TOP	USER	TOP	
		APPEND	SRC_INSTANCE	TOP	SRC_INSTANCE	TOP	

Attribute Name in Image/MPPS	Tag	Scenario	Image		MPPS		Comments
			Value Source	Destination	Value Source	Destination	
Patient ID	(0010,0020)	SCHEDULED	MWL	TOP	MWL	TOP	
		UNSCHEDULED	USER ; GENERATED	TOP	USER ; GENERATED	TOP	
		APPEND	SRC_INSTANCE	TOP	SRC_INSTANCE	TOP	
Issuer of Patient ID	(0010,0021)	SCHEDULED	MWL	TOP	MWL	TOP	
		UNSCHEDULED	N/A	N/A	EMPTY	TOP	
		APPEND	SRC_INSTANCE	TOP	SRC_INSTANCE	TOP	
Patient's Birth Date	(0010,0030)	SCHEDULED	MWL	TOP	MWL	TOP	
		UNSCHEDULED	USER	TOP	USER	TOP	
		APPEND	SRC_INSTANCE	TOP	SRC_INSTANCE	TOP	
Patient's Birth Time	(0010,0032)	SCHEDULED	MWL	TOP	MWL	TOP	
		UNSCHEDULED	USER	TOP	USER	TOP	
		APPEND	SRC_INSTANCE	TOP	SRC_INSTANCE	TOP	
Patient's Sex	(0010,0040)	SCHEDULED	MWL	TOP	MWL	TOP	
		UNSCHEDULED	USER	TOP	USER	TOP	
		APPEND	SRC_INSTANCE	TOP	SRC_INSTANCE	TOP	
Other Patient Names	(0010,1001)	SCHEDULED	MWL	TOP	N/A	N/A	
		UNSCHEDULED	USER	TOP	N/A	N/A	
		APPEND	SRC_INSTANCE	TOP	N/A	N/A	
Patient's Size	(0010,1020)	SCHEDULED	MWL ; USER	TOP	N/A	N/A	
		UNSCHEDULED	USER	TOP	N/A	N/A	
		APPEND	SRC_INSTANCE	TOP	N/A	N/A	
Patient's Weight	(0010,1030)	SCHEDULED	MWL ; USER	TOP	N/A	N/A	
		UNSCHEDULED	USER	TOP	N/A	N/A	

Attribute Name in Image/MPPS	Tag	Scenario	Image		MPPS		Comments
			Value Source	Destination	Value Source	Destination	
		APPEND	SRC_INSTANCE	TOP	N/A	N/A	
Military Rank	(0010,1080)	SCHEDULED	MWL	TOP	N/A	N/A	
		UNSCHEDULED	USER	TOP	N/A	N/A	
		APPEND	SRC_INSTANCE	TOP	N/A	N/A	
Medical Alerts	(0010,2000)	SCHEDULED	MWL	TOP	N/A	N/A	
		UNSCHEDULED	USER	TOP	N/A	N/A	
		APPEND	SRC_INSTANCE	TOP	N/A	N/A	
Allergies	(0010,2110)	SCHEDULED	MWL	TOP	N/A	N/A	
		UNSCHEDULED	USER	TOP	N/A	N/A	
		APPEND	SRC_INSTANCE	TOP	N/A	N/A	
Ethnic Group	(0010,2160)	SCHEDULED	MWL	TOP	N/A	N/A	
		UNSCHEDULED	USER	TOP	N/A	N/A	
		APPEND	SRC_INSTANCE	TOP	N/A	N/A	
Additional Patient History	(0010,21B0)	SCHEDULED	MWL	TOP	N/A	N/A	
		UNSCHEDULED	N/A	N/A	N/A	N/A	
		APPEND	SRC_INSTANCE	TOP	N/A	N/A	
Pregnancy Status	(0010,21C0)	SCHEDULED	MWL	TOP	N/A	N/A	
		UNSCHEDULED	USER	TOP	N/A	N/A	
		APPEND	SRC_INSTANCE	TOP	N/A	N/A	
Patient Comments	(0010,4000)	SCHEDULED	MWL	TOP	N/A	N/A	
		UNSCHEDULED	N/A	N/A	N/A	N/A	
		APPEND	SRC_INSTANCE	TOP	N/A	N/A	
Study Instance UID	(0020,000D)	SCHEDULED	MWL	TOP and (0040,0275)	MWL	(0040,0270)	

Attribute Name in Image/MPPS	Tag	Scenario	Image		MPPS		Comments
			Value Source	Destination	Value Source	Destination	
		UNSCHEDULED	GENERATED	TOP and (0040,0275)	GENERATED	(0040,0270)	
		APPEND	MWL ; GENERATED	TOP and (0040,0275)	MWL ; GENERATED	(0040,0270)	
Series Instance UID	(0020,000E)	SCHEDULED	GENERATED	TOP	GENERATED	(0040,0340)	
		UNSCHEDULED	GENERATED	TOP	GENERATED	(0040,0340)	
		APPEND	GENERATED	TOP	SRC_INSTANCE	(0040,0340)	
Study ID	(0020,0010)	SCHEDULED	MWL	TOP	MWL	TOP	Always taken from (0040,1001) Requested Procedure ID
		UNSCHEDULED	GENERATED	TOP	GENERATED	TOP	
		APPEND	SRC_INSTANCE	TOP	SRC_INSTANCE	TOP	
Requesting Physician	(0032,1032)	SCHEDULED	MWL ; USER	TOP	N/A	N/A	
		UNSCHEDULED	USER	TOP	N/A	N/A	
		APPEND	SRC_INSTANCE	TOP	N/A	N/A	
Requesting Service	(0032,1033)	SCHEDULED	MWL	TOP	N/A	N/A	
		UNSCHEDULED	N/A	N/A	N/A	N/A	
		APPEND	SRC_INSTANCE	TOP	N/A	N/A	
Requested Procedure Description	(0032,1060)	SCHEDULED	MWL	(0040,0275)	MWL	(0040,0270)	
		UNSCHEDULED	USER	(0040,0275)	USER	(0040,0270)	
		APPEND	SRC_INSTANCE	(0040,0275)	SRC_INSTANCE	(0040,0270)	
Admission ID	(0038,0010)	SCHEDULED	MWL	TOP	N/A	N/A	
		UNSCHEDULED	N/A	N/A	N/A	N/A	
		APPEND	SRC_INSTANCE	TOP	N/A	N/A	

Attribute Name in Image/MPPS	Tag	Scenario	Image		MPPS		Comments
			Value Source	Destination	Value Source	Destination	
Scheduled Procedure Step Description	(0040,0007)	SCHEDULED	MWL	(0040,0275)	MWL	(0040,0270)	
		UNSCHEDULED	N/A	N/A	EMPTY	(0040,0270)	
		APPEND	SRC_INSTANCE	(0040,0275)	SRC_INSTANCE	(0040,0270)	
Scheduled Protocol Code Sequence	(0040,0008)	SCHEDULED	MWL	(0040,0275)	MWL	(0040,0270)	
		UNSCHEDULED	N/A	N/A	EMPTY	(0040,0270)	
		APPEND	SRC_INSTANCE	(0040,0275)	SRC_INSTANCE	(0040,0270)	
Scheduled Procedure Step ID	(0040,0009)	SCHEDULED	MWL	(0040,0275)	MWL	(0040,0270)	
		UNSCHEDULED	GENERATED	(0040,0275)	GENERATED	(0040,0270)	
		APPEND	SRC_INSTANCE	(0040,0275)	SRC_INSTANCE	(0040,0270)	
Performed Procedure Step Description	(0040,0254)	SCHEDULED	MWL	TOP	SRC_INSTANCE	TOP	In case of MWL, value is taken from (0040,0007) Scheduled Procedure Step Description
		UNSCHEDULED	USER	TOP	SRC_INSTANCE	TOP	In case of USER, value is taken from (0032,1060) Requested Procedure Description
		APPEND	SRC_INSTANCE	TOP	SRC_INSTANCE	TOP	
Requested Procedure ID	(0040,1001)	SCHEDULED	MWL	(0040,0275)	MWL	(0040,0270)	
		UNSCHEDULED	USER	(0040,0275)	USER	(0040,0270)	
		APPEND	SRC_INSTANCE	(0040,0275)	SRC_INSTANCE	(0040,0270)	

Attribute Name in Image/MPPS	Tag	Scenario	Image		MPPS		Comments
			Value Source	Destination	Value Source	Destination	
Reason for the Requested Procedure	(0040,1002)	SCHEDULED	MWL	(0040,0275)	N/A	N/A	
		UNSCHEDULED	N/A	N/A	N/A	N/A	
		APPEND	SRC_INSTANCE	(0040,0275)	N/A	N/A	

Annex E Code Set Usage

syngo CT is following the latest SNOMED CT code definitions as far as possible.
In case private codes are used/created they are documented within Annex A/B.

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Published by Siemens Healthineers AG ·Doc-Ident. 11269770-EKL-YKO · Copyright © Siemens Healthineers AG, 2025